(9)
Supreme Court, U.S.
FILED
APR 25 2003

No. 02-658

IN THE

Supreme Court of the United States

STATE OF ALASKA, DEPARTMENT OF ENVIRONMENTAL CONSERVATION,

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Ninth Circuit

JOINT APPENDIX

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PETITION FOR CERTIORARI FILED OCTOBER 25, 2002
CERTIORARI GRANTED FEBRUARY 24, 2003

TABLE OF CONTENTS

	Page
Relevant Docket Entries from the United States Court of Appeals for the Ninth Circuit (No. 00-70166)	1
Relevant Docket Entries from the United States Court of Appeals for the Ninth Circuit (No. 00-70169)	11
Relevant Docket Entries from the United States Court of Appeals for the Ninth Circuit (No. 00-70175)	21
Relevant Docket Entries from the United States Court of Appeals for the Ninth Circuit (No. 00-70301)	31
Cominco Alaska, Incorporated, Index to the Administrative Record	41
Alaska Department of Environmental Conservation Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005 (May 4, 1999)	55
Alaska Department of Environmental Conservation Air Quality Construction Permit, Permit No. 9932-AC005 (May 4, 1999)	89
Letter from Anita Frankel, Director, Office of Air Quality, United States Environmental Protection Agency, Region 10, to Tom Chapple, Alaska Department of Environmental Conservation (July 29, 1999)	96
Memorandum from Brian Renninger, Envir. Engin. Asst., Air Permits Program, State of Alaska, Department of Environmental Conservation, to Jim Baumgartner, Supervisor, Construction Permits (Aug. 10, 1999)	99

TABLE OF CONTENTS—Continued

Page

Alaska Department of Environmental Conservation Final Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005 (Sept. 1, 1999) 105

Letter from Anita Frankel, Director, Office of Air Quality, United States Environmental Protection Agency, Region 10, to Tom Chapple, Alaska Department of Environmental Conservation (Sept. 15, 1999) 118

Letter from Anita Frankel, Director, Office of Air Quality, United States Environmental Protection Agency, Region 10, to Tom Chapple, Alaska Department of Environmental Conservation (Sept. 28, 1999) 121

Letter from Charlotte L. MacCay, Senior Administrator, Environmental and Regulatory Affairs, Cominco Alaska, Inc., to Anita Frankel, United States Environmental Protection Agency, Region 10 (Oct. 8, 1999) 131

Memorandum from Charlotte L. MacCay, Senior Administrator, Environmental and Regulatory Affairs, Cominco Alaska, Inc., to Chuck Findley, United States Environmental Protection Agency, Region 10 (Oct. 29, 1999) 134

Letter from Chuck Findley, Deputy Regional Administrator, United States Environmental Protection Agency, Region 10, to Michele Brown, Alaska Department of Environmental Conservation (Nov. 10, 1999) 136

Letter from John Key, Cominco Alaska, Inc., to Chuck Clarke, Regional Administrator, United States Environmental Protection Agency, Region 10 141

TABLE OF CONTENTS—Continued

Page

Letter from Chuck Findley, Deputy Regional Administrator, United States Environmental Protection Agency, Region 10, to Michele Brown, Alaska Department of Environmental Conservation (Dec. 10, 1999) 148

Alaska Department of Environmental Conservation Air Quality Construction Permit, Permit No. 9932-AC005 (Dec. 10, 1999) 152

Alaska Department of Environmental Conservation Final Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005 (Dec. 10, 1999) 159

Response to Comments, Cominco Alaska, Red Dog Mine, Production Rate Increase Project, Air Quality Construction Permit, No. 9932-AC005 225

Letter from Michele Brown, Alaska Department of Environmental Conservation, to Chuck Clarke and Chuck Findley, United States Environmental Protection Agency, Region 10 (Jan. 5, 2000) 247

Letter from Chuck Findley, Deputy Regional Administrator, United States Environmental Protection Agency, Region 10, to Norman Mahoney, Cominco Alaska, Inc. (Feb. 8, 2000) 253

Letter from Chuck Findley, Deputy Regional Administrator, United States Environmental Protection Agency, Region 10, to Michele Brown, Alaska Department of Environmental Conservation (Feb. 8, 2000) 256

TABLE OF CONTENTS—Continued

Page

Letter from Chuck Findley, Deputy Regional Administrator, United States Environmental Protection Agency, Region 10, to Robert Connery, Holland and Hart (Mar. 7, 2000) 260

Letter from Chuck Findley, Deputy Regional Administrator, United States Environmental Protection Agency, Region 10, to Norman Mahoney, Cominco Alaska, Inc. (Mar. 7, 2000)..... 264

Memorandum from Michael S. Alushin, Associate Enforcement Counsel for Air, and Edward E. Reich, Director, Stationary Source Compliance Division, United States Environmental Protection Agency, to Regional Counsel, Regions I-X, Directors, Air Management Divisions, Regions I, V and IX, and Directors, Air and Waste Management Divisions, Regions II-IV, VI-VIII, and X (Dec. 14, 1983)..... 266

Memorandum from Michael S. Alushin, Associate Enforcement Counsel for Air, and John S. Seitz, Director, Stationary Source Compliance Division, United States Environmental Protection Agency, to Addressees (July 15, 1988)..... 272

Declaration of Douglas E. Hardesty (May 23, 2001)..... 275

TABLE OF CONTENTS—Continued

Page

The appendix to the petition for certiorari contains the following material which is omitted from the Joint Appendix:

Appendix A: Opinion of the United States Court of Appeals for the Ninth Circuit (July 30, 2002)..... 1a

Appendix B: Opinion of the United States Court of Appeals for the Ninth Circuit (Mar. 27, 2001)..... 17a

Appendix C: Order of the United States Court of Appeals for the Ninth Circuit (Feb. 28, 2002) 24a

Appendix D: EPA Finding of Noncompliance and Order (Dec. 10, 1999)..... 26a

Appendix E: EPA Administrative Order (Feb. 8, 2000)..... 38a

Appendix F: EPA Amended Administrative Order (Mar. 7, 2000) 51a

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

No. 00-70166

STATE OF ALASKA, Department of Environmental Conservation,

Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

DOCKET ENTRIES

DATE	PROCEEDINGS
2/8/00	FILED PETITION FOR REVIEW DOCKETED CAUSE AND ENTERED APPEARANCES OF COUNSEL, NOTIFIED RESPONDENTS OF FILING, SENT PETITIONER CIVIL APPEALS DOCKETING STATEMENT. setting schedule as follows: petitioners' opening brief is due 4/28/00; respondents' brief is due 5/30/00; petitioner's optional reply brief is due 6/12/00. [00-70166] (wp) [00-70166]
3/20/00	Filed joint mtn to consolidate (00-70166/70169/70175/70301) set coordinated briefing schedule, and extend deadline for filing of the certified index to record; served 3/17/00. (MOATT via PROMO) [00-70166, 00-70169, 00-70175, 00-

70301] [3873459] (rc) [00-70166 00-70169 00-70175 00-70301]

4/4/00 Received Respondent EPA's opposition to motion for stay and cross-motion to dismiss; served on 4/3/00. (opposition exceeds FRAP limits – motion pending – MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/17/00 Received Cominco Alaska in 00-70169, 00-70175, 00-70301 reply in opposition to motion to dismiss. served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/19/00 Received State's opposition to EPA's motion to dismiss petitions. (served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/28/00 Received Respondents' reply in support of mtn to dismiss petitions for lack of subject matter jurisdiction; unopposed mtn of respondents for leave to file an oversized reply in support of mtn to dismiss petition for lack of subject matter jurisdiction; respondents' ntc of suppl administrative action; served on 4/27/00. (MOATT) [00-70166, 00-70169, 00-70175, 00-70301] (rc) [00-70166 00-70169 00-70175 00-70301]

5/9/00 Received Cominco Alaska opposition to motion to dismiss. (served on 5/8/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

5/11/00 Filed Petitioner State of Alaska surreply in opposition to motion to dismiss along with a motion to allow filing of surreply; served on 5/9/00 (MOATT) [00-70166] (wp) [00-70166]

6/1/00 Filed order (Harry PREGERSON, Ferdinand F. FERNANDEZ, Kim M. WARDLAW): Petitioner the State of Alaska Department of Environmental Conservation ("ADEC"), petitioner Cominco Alaska Incorporated ("Cominco") and respondents the U.S. Environmental Protection Agency, Carol M. Browner and Chuck Clarke's (EPA) 3/20/00 joint motion to consolidate petition 00-70166, 00-70169, 00-70175 and 00-70301 is granted. Petition nos. 00-70166, 00-70169, 00-70175 and 00-70301 are consolidated. Petitioner Cominco's unopposed motion for leave to file an oversized motion for stay is granted. The Clerk shall file Cominco's 3/20/00 motion for stay. Petitioner ADEC's March 31, 2000 motion for joinder in Cominco's motion for stay of the EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is granted. Respondents' March 28, 2000 motion for extension of time to file the response to petitioners' motion for stay is granted. Respondents' unopposed 4/4/00 motion for leave to file an oversized opposition to petitioners' motion for stay is granted. The Clerk shall file respondents' 4/4/00 opposition to petitioners' motion for stay, and respondents cross-motion to dismiss. The Clerk shall also file respondents' 4/6/00 addendum to its opposition to the motion for stay, and respondents' motion to dismiss. Petitioner Cominco's unopposed motion to file an oversized reply in support of its motion to dismiss is granted. The Clerk shall file the reply received 4/28/00. Petitioner Cominco's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The Clerk shall file the surreply rec'd 5/9/00. The Clerk shall file petitioner ADEC's 4/19/00 opposition to respondents' motion to dismiss. Petitioner ADEC's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The surreply was filed 5/11/00. Petitioner

ADEC's motion for oral argument is denied. Petitioner Cominco's March 20, 2000 motion to stay respondent EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is denied. Respondents' 4/4/00 cross-motion to dismiss is denied. The 3/20/00 joint motion of Petitioners ADEC, Cominco and respondent EPA to extend the time to file the certified index to the admin record is granted. The certified index to the admin record is due 6/26/00. Respondents' 4/3/00 motion to stay filing of the certified index to the admin record is denied as moot. The following briefing schedule shall govern these consolidated petitions for review: the opening briefs are due 6/26/00; the answering brief is due 7/26/00. Requests for extension of time will be looked upon with disfavor. All parties on a side are encouraged to join in a single brief to the greatest extent practicable. All briefs shall comply with the page and type-volume limitations set forth in FRAP 32(a)(7). If all parties on a side file a joint brief, these parties may, in accordance with Ninth Circuit Rule 28-4, timely move for enlargement of size of 5 monotype pages or 1,400 words. Requests for enlargement of size greater than 5 pages or 1,400 words will be looked upon with extreme disfavor. MOTION FOR STAY DENIED; MOTION TO DISMISS DENIED. [00-70166, 00-70169, 00-70175, 00-70301] (ft) [00-70166 00-70169 00-70175 00-70301]

6/23/00 Received Respondent EPA in 00-70166's Notice of filing certified index to the Admin. Record, served on 6/22/00 (Casefile) [00-70166] (kc) [00-70166]

6/29/00 Filed original and 15 copies Petitioner State of Alaska in 00-70166, Petitioner Cominco Alaska in 00-70169, Petitioner Cominco Alaska Inc. in

00-70175, Petitioner Cominco Alaska in 00-70301 opening brief (Informal: n) 57 pages and five excerpts of record in 2 volumes; served on 6/26/00 [00-70166, 00-70169, 00-70175, 00-70301] (je) [00-70166 00-70169 00-70175 00-70301]

8/17/00 Filed original and 15 copies respondent EPA in 00-70166, 00-70169, 00-70175, 00-70301 in 66 pages brief, 5 Exc. in 1 vol; served on 8/16/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/7/00 Filed original and 15 copies State of Alaska, Cominco Alaska, Cominco Alaska Inc., Cominco Alaska's reply brief, (Informal: no) 46 pages; with 5 Sup. Exc of Record in 1 volume; served on 9/5/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/10/01 Filed Order (Deputy Clerk: gb) Petitioner's motion to expedite and decision on appeal is DENIED. Petitioner's motion to allow longer oral argument is also DENIED. NANA Regional Corporation, Inc.'s motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. NANA Regional Corporation, Inc. shall be notified by mail through its general counsel, Jacquelyn R. Luke, at 1001 E. Benson Blvd., Anchorage, AK 99508 (907)265-4148. The Native Village of Kivalina's motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. The Native Village of Kivalina shall be notified by mail through its atty and trustee, Michael J. Frank, at 1026 West 4th Ave., Ste 201, Anchorage, AK 99501 (907)276-4244x116) (faxed to PANEL and phoned counsels at 3:00p.m.) [00-

70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/11/01 FILED CERTIFIED COPY OF ADMINISTRATIVE RECORD ON APPEAL: 1 CARTON CONTAINING 87 DOCUMENTS.(ORIGINAL) [00-70166] [00-70166] (sd) [00-70166]

2/9/01 Received Andrew J. Doyle for Respondent EPA letter dated 2/8/01 re: current event relating to the Dec 10, 99 prevention of significant deterioration construction permit (No.9932-AC005) that Petitioner State of Alaska, Dept of Environmental Conservation issued to Petitioner Cominco Alaska, Inc. (with attachment) (faxed to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/13/01 ARGUED AND SUBMITTED TO Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD [00-70166, 00-70169, 00-70175, 00-70301] (ss) [00-70166 00-70169 00-70175 00-70301]

3/27/01 Filed Order (FOR PUBLICATION) (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Within 60 days of this order, the EPA may either (1) submit a complete administrative record which will allow this Court to review the justification for the EPA's decision to issue the Orders before us; (2) withdraw the Orders that are the subjects of these petitions or (3) file an enforcement action, (cite), in the appropriate U.S. District Court....(Please see casefile for complete text) Should the EPA opt to submit the administrative record rather than to pursue an enforcement action or to withdraw its Orders, petitioners and respondents are ordered to file, within 21 days of such submission, supplemental briefs, not to exceed 15 pgs, assessing the im-

pact, if any, (cite), on the question whether it is the EPA or ADEC which has the ultimate authority to make BACT determinations. The parties shall provide notice of the status of these proceedings to this Court within 60 days hereof. Submission of this matter is hereby vacated until further notice by this Court. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Respondent EPA's supplemental brief of 11 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Petitioner State of Alaska, Petitioner Cominco Alaska Incorporated's supplemental brief of 13 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

8/3/01 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) The Alaska Dept of Environment Conservation's ("ADEC") motion for leave to file a response to the EPA's Hardesty Declaration is DENIED. We further order, however, ADEC and Cominco Alaska, Inc. ("Cominco") to file a response to the Hardesty Declaration that states whether they agree that the material provided by the EPA and described in the Hardesty Declaration constitutes the complete administrative record in this proceedings as both a factual and legal matter. If ADEC and Cominco contend that the materials described in the Hardesty Declaration do not constitute a complete administrative record, they are further ordered to provide legal authority for

this proposition and evidence that additional material exists. In addition, they are ordered to provide legal authority for any proposed form of relief, such as discovery, they may seek to remedy any asserted failure by the EPA to provide the complete administrative record. ADEC and Cominco are further ordered to file their responses or a combined response within 14 days of the date hereof. The EPA may file a response within 10 days thereafter. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/28/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Having considered the recent submissions of the parties agreeing to the factual record on appeal and the brfs filed beginning in 6/2000 (almost two yrs ago), we have determined that supp briefing would be of assistance in the determination of the cause. Therefore, it is ORDERED that each side file a supp brf not to exceed 25 pgs within 28 days of the date hereof on the following question: whether it is the state of Alaska (through ADEC) or the EPA that bears the ultimate legal authority and responsibility under the Clean Air Act to determine whether an individual Prevention of Significant Deterioration permit issued by Alaska pursuant to its State Implementation Plan (SIP) meets the requirements of the Clean Air Act or the SIP. If any party desires additional oral argument in this matter, it should file a request, along with a brf statement of the reasons it believes additional argument is necessary. It is so ORDERED. (served PANEL; phoned and faxed to csls at 3:00p.m.; c.c. Front Counter) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/28/02 Filed Original and 15 copies of Respondent EPA's Supplemental brief of 25 pages pursuant to ct's order of 2/28/02; served on 3/27/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/29/02 Filed Original and 15 copies Petitioner Cominco Alaska Incorporated's supplemental brief of 25 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

4/1/02 Filed original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) This cs is hereby resubmitted as of the date of this order. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Case resubmitted on this date to Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD. (See previous deferral of submission.) Order filed: 7/30/02. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 FILED OPINION: DENIED. (Terminated on the Merits after Oral Hearing; Enforced; Written, Signed, Published. Stephen R. REINHARDT; Kim M. WARDLAW, author; Ronald M. GOULD.) FILED AND ENTERED JUDGMENT. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/23/02	MANDATE ISSUED [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
11/4/02	Received notice from Supreme Court: petition for certiorari filed on 10/25/02 and placed on the docket 10/31/02; Supreme Court No. 02-658. (CASEFILES) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
2/28/03	Received notice from Supreme Court, petition for certiorari GRANTED on 2/24/03. Supreme Court No. 02-658. (faxed to PANEL) (re-entered) (af) [00-70166 00-70169 00-70175 00-70301]

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

No. 00-70169

TECK COMINCO ALASKA INCORPORATED,
Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,
Respondent.

DOCKET ENTRIES

DATE	PROCEEDINGS
2/8/00	FILED PETITION FOR REVIEW; DOCKETED CAUSE AND ENTERED APPEARANCES OF COUNSEL. NOTIFIED RESPONDENTS OF FILING. Setting schedule as follows: petitioners' opening brief is due 5/1/00; respondents' brief is due 5/31/00; petitioner's optional reply brief is due within fourteen days from service of the answering brief. [00-70169] (dl) [00-70169]
3/20/00	Filed joint mtn to consolidate (00-70166/70169/70175/70301) set coordinated briefing schedule, and extend deadline for filing of the certified index to record; served 3/17/00. (MOATT via PROMO) [00-70166, 00-70169, 00-70175, 00-70301] [3873459] (rc) [00-70166 00-70169 00-70175 00-70301]
4/4/00	Received Respondent EPA's opposition to motion for stay and cross-motion to dismiss;

served on 4/3/00. (opposition exceeds FRAP limits - motion pending - MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/6/00 Received Respondent EPA's addendum to opposition to petitioner's motion for stay and cross-motion to dismiss; served on 4/5/00. (MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/17/00 Received Cominco Alaska in 00-70169, 00-70175, 00-70301 reply in opposition to motion to dismiss. served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/19/00 Received State's opposition to EPA'S motion to dismiss petitions. (served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/28/00 Received Respondents' reply in support of mtn to dismiss petitions for lack of subject matter jurisdiction; unopposed mtn of respondents for leave to file an oversized reply in support of mtn to dismiss petition for lack of subject matter jurisdiction; respondents' ntc of suppl administrative action; served on 4/27/00. (MOATT) [00-70166, 00-70169, 00-70175, 00-70301] (rc) [00-70166 00-70169 00-70175 00-70301]

5/9/00 Received Cominco Alaska opposition to motion to dismiss. (served on 5/8/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

6/1/00 Filed order (Harry PREGERSON, Ferdinand F. FERNANDEZ, Kim M. WARDLAW): Petitioner the State of Alaska Department of Environmental Conservation ("ADEC"), petitioner

Cominco Alaska Incorporated ("Cominco") and respondents the U.S. Environmental Protection Agency, Carol M. Browner and Chuck Clarke's (EPA) 3/20/00 joint motion to consolidate petition 00-70166, 00-70169, 00-70175 and 00-70301 is granted. Petition nos. 00-70166, 00-70169, 00-70175 and 00-70301 are consolidated. Petitioner Cominco's unopposed motion for leave to file an oversized motion for stay is granted. The Clerk shall file Cominco's 3/20/00 motion for stay. Petitioner ADEC's March 31, 2000 motion for joinder in Cominco's motion for stay of the EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is granted. Respondents' March 28, 2000 motion for extension of time to file the response to petitioners' motion for stay is granted. Respondents' unopposed 4/4/00 motion for leave to file an oversized opposition to petitioners' motion for stay is granted. The Clerk shall file respondents' 4/4/00 opposition to petitioners' motion for stay, and respondents cross-motion to dismiss. The Clerk shall also file respondents' 4/6/00 addendum to its opposition to the motion for stay, and respondents' motion to dismiss. Petitioner Cominco's unopposed motion to file an oversized reply in support of its motion to dismiss is granted. The Clerk shall file the reply received 4/28/00. Petitioner Cominco's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The Clerk shall file the surreply rec'd 5/9/00. The Clerk shall file petitioner ADEC's 4/19/00 opposition to respondents' motion to dismiss. Petitioner ADEC's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The surreply was filed 5/11/00. Petitioner ADEC's motion for oral argument is denied. Petitioner Cominco's March 20, 2000 motion to stay re-

spondent EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is denied. Respondents' 4/4/00 cross-motion to dismiss is denied. The 3/20/00 joint motion of Petitioners ADEC, Cominco and respondent EPA to extend the time to file the certified index to the admin record is granted. The certified index to the admin record is due 6/26/00. Respondents' 4/3/00 motion to stay filing of the certified index to the admin record is denied as moot. The following briefing schedule shall govern these consolidated petitions for review: the opening briefs are due 6/26/00; the answering brief is due 7/26/00. Requests for extension of time will be looked upon with disfavor. All parties on a side are encouraged to join in a single brief to the greatest extent practicable. All briefs shall comply with the page and type-volume limitations set forth in FRAP 32(a)(7). If all parties on a side file a joint brief, these parties may, in accordance with Ninth Circuit Rule 28-4, timely move for enlargement of size of 5 monotype pages or 1,400 words. Requests for enlargement of size greater than 5 pages or 1,400 words will be looked upon with extreme disfavor. MOTION FOR STAY DENIED; MOTION TO DISMISS DENIED. [00-70166, 00-70169, 00-70175, 00-70301] (ft) [00-70166 00-70169 00-70175 00-70301]

6/29/00 Filed original and 15 copies Petitioner State of Alaska in 00-70166, Petitioner Cominco Alaska in 00-70169, Petitioner Cominco Alaska Inc. in 00-70175, Petitioner Cominco Alaska in 00-70301 opening brief (Informal: n) 57 pages and five excerpts of record in 2 volumes; served on 6/26/00 [00-70166, 00-70169, 00-70175, 00-70301] (je) [00-70166 00-70169 00-70175 00-70301]

8/17/00 Filed original and 15 copies respondent EPA in 00-70166, 00-70169, 00-70175, 00-70301 in 66 pages brief, 5 Exc. in 1 vol; served on 8/16/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/7/00 Filed original and 15 copies State of Alaska, Cominco Alaska, Cominco Alaska Inc., Cominco Alaska's reply brief, (Informal: no) 46 pages; with 5 Sup. Exc of Record in 1 volume; served on 9/5/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/10/01 Filed Order (Deputy Clerk: gb) Petitioner's motion to expedite and decision on appeal is DENIED. Petitioner's motion to allow longer oral argument is also DENIED. NANA Regional Corporation, Inc.'s motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. NANA Regional Corporation, Inc. shall be notified by mail through its general counsel, Jacquelyn R. Luke, at 1001 E. Benson Blvd., Anchorage, AK 99508 (907)265-4148. The Native Village of Kivalina's motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. The Native Village of Kivalina shall be notified by mail through its atty and trustee, Michael J. Frank, at 1026 West 4th Ave., Ste 201, Anchorage, AK 99501 (907)276-4244x116) (faxed to PANEL and phoned counsels at 3:00p.m.) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/11/01 FILED CERTIFIED COPY OF ADMINISTRATIVE RECORD ON APPEAL: 1 CARTON CONTAINING 87 DOCUMENTS.(ORIGINAL) [00-70166] [00-70166] (sd) [00-70166]

2/9/01 Received Andrew J. Doyle for Respondent EPA letter dated 2/8/01 re: current event relating to the Dec 10, 99 prevention of significant deterioration construction permit (No.9932-AC005) that Petitioner State of Alaska, Dept of Environmental Conservation issued to Petitioner Cominco Alaska, Inc. (with attachment) (faxed to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/13/01 ARGUED AND SUBMITTED TO Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD [00-70166, 00-70169, 00-70175, 00-70301] (ss) [00-70166 00-70169 00-70175 00-70301]

3/27/01 Filed Order (FOR PUBLICATION) (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Within 60 days of this order, the EPA may either (1) submit a complete administrative record which will allow this Court to review the justification for the EPA's decision to issue the Orders before us; (2) withdraw the Orders that are the subjects of these petitions or (3) file an enforcement action, (cite), in the appropriate U.S. District Court....(Please see casefile for complete text) Should the EPA opt to submit the administrative record rather than to pursue an enforcement action or to withdraw its Orders, petitioners and respondents are ordered to file, within 21 days of such submission, supplemental briefs, not to exceed 15 pgs, assessing the impact, if any, (cite), on the question whether it is the EPA or ADEC which has the ultimate authority to make BACT determinations. The parties shall provide notice of the status of these proceedings to this Court within 60 days hereof. Submission of this matter is hereby vacated until

further notice by this Court. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Respondent EPA's supplemental brief of 11 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Petitioner State of Alaska, Petitioner Cominco Alaska Incorporated's supplemental brief of 13 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

8/3/01 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) The Alaska Dept of Environment Conservation's ("ADEC") motion for leave to file a response to the EPA's Hardesty Declaration is DENIED. We further order, however, ADEC and Cominco Alaska, Inc. ("Cominco") to file a response to the Hardesty Declaration that states whether they agree that the material provided by the EPA and described in the Hardesty Declaration constitutes the complete administrative record in this proceedings as both a factual and legal matter. If ADEC and Cominco contend that the materials described in the Hardesty Declaration do not constitute a complete administrative record, they are further ordered to provide legal authority for this proposition and evidence that additional material exists. In addition, they are ordered to provide legal authority for any proposed form of relief, such as discovery, they may seek to remedy any asserted failure by the EPA to provide the complete administrative record. ADEC and

Cominco are further ordered to file their responses or a combined response within 14 days of the date hereof. The EPA may file a response within 10 days thereafter. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/28/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD,) Having considered the recent submissions of the parties agreeing to the factual record on appeal and the brfs filed beginning in 6/2000 (almost two yrs ago), we have determined that supp briefing would be of assistance in the determination of the cause. Therefore, it is ORDERED that each side file a supp brf not to exceed 25 pgs within 28 days of the date hereof on the following question: whether it is the state of Alaska (through ADEC) or the EPA that bears the ultimate legal authority and responsibility under the Clean Air Act to determine whether an individual Prevention of Significant Deterioration permit issued by Alaska pursuant to its State Implementation Plan (SIP) meets the requirements of the Clean Air Act or the SIP. If any party desires additional oral argument in this matter, it should file a request, along with a brf statement of the reasons it believes additional argument is necessary. It is so ORDERED. (served PANEL; phoned and faxed to csls at 3:00p.m.; c.c. Front Counter) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/28/02 Filed original and 15 copies of Respondent EPA's Supplemental brief of 25 pages pursuant to ct's order of 2/28/02; served on 3/27/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/29/02 Filed Original and 15 copies Petitioner Cominco Alaska Incorporated's supplemental brief of 25 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

4/1/02 Filed Original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (per 2/28/02 order of the ct) (PANEL) [00-70166, 00-70169, (af) [00-70169 00-70175 00-70301]

4/1/02 Filed original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) This cs is hereby resubmitted as of the date of this order. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Case resubmitted on this date to Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD. (See previous deferral of submission.) Order filed: 7/30/02. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 FILED OPINION: DENIED. (Terminated on the Merits after Oral Hearing; Enforced; Written, Signed, Published. Stephen R. REINHARDT; Kim M. WARDLAW, author; Ronald M. GOULD.) FILED AND ENTERED JUDGMENT. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/23/02	MANDATE ISSUED [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
11/4/02	Received notice from Supreme Court: petition for certiorari filed on 10/25/02 and placed on the docket 10/31/02; Supreme Court No. 02-658. (CASEFILES) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
2/28/03	Received notice from Supreme Court, petition for certiorari GRANTED on 2/24/03. Supreme Court No. 02-658. (faxed to PANEL) (re-entered) (af) [00-70166 00-70169 00-70175 00-70301]

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

No. 00-70175

TECK COMINCO ALASKA INCORPORATED,
Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,
Respondent.

DOCKET ENTRIES

DATE	PROCEEDINGS
2/15/00	FILED PETITION FOR REVIEW DOCKETED CAUSE AND ENTERED APPEARANCES OF COUNSEL, NOTIFIED RESPONDENTS OF FILING, SENT PETITIONER CIVIL APPEALS DOCKETING STATEMENT. setting schedule as follows: petitioners' opening brief is due 5/5/00; respondents' brief is due 6/5/00; petitioner's optional reply brief is due 6/19/00. [00-70175] (vt) [00-70175]
3/20/00	Filed joint mtn to consolidate (00-70166/70169/70175/70301) set coordinated briefing schedule, and extend deadline for filing of the certified index to record; served 3/17/00. (MOATT via PROMO) [00-70166, 00-70169, 00-70175, 00-70301] [3873459] (rc) [00-70166 00-70169 00-70175 00-70301]

4/4/00 Received Respondent EPA's opposition to motion for stay and cross-motion to dismiss; served on 4/3/00. (opposition exceeds FRAP limits - motion pending - MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/6/00 Received Respondent EPA's addendum to opposition to petitioner's motion for stay and cross-motion to dismiss; served on 4/5/00. (MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/17/00 Received Cominco Alaska in 00-70169, 00-70175, 00-70301 reply in opposition to motion to dismiss. served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/19/00 Received State's opposition to EPA's motion to dismiss petitions. (served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/28/00 Received Respondents' reply in support of mtn to dismiss petitions for lack of subject matter jurisdiction; unopposed mtn of respondents for leave to file an oversized reply in support of mtn to dismiss petition for lack of subject matter jurisdiction; respondents' ntc of suppl administrative action; served on 4/27/00. (MOATT) [00-70166, 00-70169, 00-70175, 00-70301] (rc) [00-70166 00-70169 00-70175 00-70301]

5/9/00 Received Cominco Alaska opposition to motion to dismiss. (served on 5/8/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

6/1/00 Filed order (Harry PREGERSON, Ferdinand F. FERNANDEZ, Kim M. WARDLAW): Petitioner the State of Alaska Department of Environmental Conservation ("ADEC"), petitioner Cominco Alaska Incorporated ("Cominco") and respondents the U.S. Environmental Protection Agency, Carol M. Browner and Chuck Clarke's (EPA) 3/20/00 joint motion to consolidate petition 00-70166, 00-70169, 00-70175 and 00-70301 is granted. Petition nos. 00-70166, 00-70169, 00-70175 and 00-70301 are consolidated. Petitioner Cominco's unopposed motion for leave to file an oversized motion for stay is granted. The Clerk shall file Cominco's 3/20/00 motion for stay. Petitioner ADEC's March 31, 2000 motion for joinder in Cominco's motion for stay of the EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is granted. Respondents' March 28, 2000 motion for extension of time to file the response to petitioners' motion for stay is granted. Respondents' unopposed 4/4/00 motion for leave to file an oversized opposition to petitioners' motion for stay is granted. The Clerk shall file respondents' 4/4/00 opposition to petitioners' motion for stay, and respondents cross-motion to dismiss. The Clerk shall also file respondents' 4/6/00 addendum to its opposition to the motion for stay, and respondents' motion to dismiss. Petitioner Cominco's unopposed motion to file an oversized reply in support of its motion to dismiss is granted. The Clerk shall file the reply received 4/28/00. Petitioner Cominco's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The Clerk shall file the surreply rec'd 5/9/00. The Clerk shall file petitioner ADEC's 4/19/00 opposition to respondents' motion to dismiss. Petitioner ADEC's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The surreply was filed 5/11/00. Petitioner ADEC's

motion for oral argument is denied. Petitioner Cominco's March 20, 2000 motion to stay respondent EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is denied. Respondents' 4/4/00 cross-motion to dismiss is denied. The 3/20/00 joint motion of Petitioners ADEC, Cominco and respondent EPA to extend the time to file the certified index to the admin record is granted. The certified index to the admin record is due 6/26/00. Respondents' 4/3/00 motion to stay filing of the certified index to the admin record is denied as moot. The following briefing schedule shall govern these consolidated petitions for review: the opening briefs are due 6/26/00; the answering brief is due 7/26/00. Requests for extension of time will be looked upon with disfavor. All parties on a side are encouraged to join in a single brief to the greatest extent practicable. All briefs shall comply with the page and type-volume limitations set forth in FRAP 32(a)(7). If all parties on a side file a joint brief, these parties may, in accordance with Ninth Circuit Rule 28-4, timely move for enlargement of size of 5 monotype pages or 1,400 words. Requests for enlargement of size greater than 5 pages or 1,400 words will be looked upon with extreme disfavor. MOTION FOR STAY DENIED; MOTION TO DISMISS DENIED. [00-70166, 00-70169, 00-70175, 00-70301] (ft) [00-70166 00-70169 00-70175 00-70301]

6/29/00 Filed original and 15 copies Petitioner State of Alaska in 00-70166, Petitioner Cominco Alaska in 00-70169, Petitioner Cominco Alaska Inc. in 00-70175, Petitioner Cominco Alaska in 00-70301 opening brief (Informal: n) 57 pages and five excerpts of record in 2 volumes; served on 6/26/00 [00-70166, 00-70169, 00-70175, 00-70301] (je) [00-70166 00-70169 00-70175 00-70301]

8/17/00 Filed original and 15 copies respondent EPA in 00-70166, 00-70169, 00-70175, 00-70301 in 66 pages brief, 5 Exc. in 1 vol; served on 8/16/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/7/00 Filed original and 15 copies State of Alaska, Cominco Alaska, Cominco Alaska Inc., Cominco Alaska's reply brief, (Informal: no) 46 pages; with 5 Sup. Exc of Record in 1 volume; served on 9/5/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

12/13/00 Received Cominco Alaska's additional citations; served on 12/12/00. (RECORDS FOR MERIT PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/10/01 Filed Order (Deputy Clerk: gb) Petitioner's motion to expedite and decision on appeal is DENIED. Petitioner's motion to allow longer oral argument is also DENIED. NANA Regional Corporation, Inc.'s motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. NANA Regional Corporation, Inc. shall be notified by mail through its general counsel, Jacquelyn R. Luke, at 1001 E. Benson Blvd., Anchorage, AK 99508 (907)265-4148. The Native Village of Kivalina's motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. The Native Village of Kivalina shall be notified by mail through its atty and trustee, Michael J. Frank, at 1026 West 4th Ave., Ste 201, Anchorage, AK 99501 (907)276-4244x116) (faxed to PANEL and phoned counsels at 3:00p.m.) [00-

70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/11/01 FILED CERTIFIED COPY OF ADMINISTRATIVE RECORD ON APPEAL: 1 CARTON CONTAINING 87 DOCUMENTS.(ORIGINAL) [00-70166] [00-70166] (sd) [00-70166]

2/9/01 Received Andrew J. Doyle for Respondent EPA letter dated 2/8/01 re: current event relating to the Dec 10, 99 prevention of significant deterioration construction permit (No.9932-AC005) that Petitioner State of Alaska, Dept of Environmental Conservation issued to Petitioner Cominco Alaska, Inc. (with attachment) (faxed to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/13/01 ARGUED AND SUBMITTED TO Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD [00-70166, 00-70169, 00-70175, 00-70301] (ss) [00-70166 00-70169 00-70175 00-70301]

3/27/01 Filed Order (FOR PUBLICATION) (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Within 60 days of this order, the EPA may either (1) submit a complete administrative record which will allow this Court to review the justification for the EPA's decision to issue the Orders before us; (2) withdraw the Orders that are the subjects of these petitions or (3) file an enforcement action, (cite), in the appropriate U.S. District Court....(Please see casefile for complete text) Should the EPA opt to submit the administrative record rather than to pursue an enforcement action or to withdraw its Orders, petitioners and respondents are ordered to file, within 21 days of such submission, supplemental briefs, not to exceed 15 pgs, assessing the im-

pact, if any, (cite), on the question whether it is the EPA or ADEC which has the ultimate authority to make BACT determinations. The parties shall provide notice of the status of these proceedings to this Court within 60 days hereof. Submission of this matter is hereby vacated until further notice by this Court. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Respondent EPA's supplemental brief of 11 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Petitioner State of Alaska, Petitioner Cominco Alaska Incorporated's supplemental brief of 13 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

8/3/01 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) The Alaska Dept of Environment Conservation's ("ADEC") motion for leave to file a response to the EPA's Hardesty Declaration is DENIED. We further order, however, ADEC and Cominco Alaska, Inc. ("Cominco") to file a response to the Hardesty Declaration that states whether they agree that the material provided by the EPA and described in the Hardesty Declaration constitutes the complete administrative record in this proceedings as both a factual and legal matter. If ADEC and Cominco contend that the materials described in the Hardesty Declaration do not constitute a complete administrative record, they are further ordered to provide legal authority for

this proposition and evidence that additional material exists. In addition, they are ordered to provide legal authority for any proposed form of relief, such as discovery, they may seek to remedy any asserted failure by the EPA to provide the complete administrative record. ADEC and Cominco are further ordered to file their responses or a combined response within 14 days of the date hereof. The EPA may file a response within 10 days thereafter. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/28/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Having considered the recent submissions of the parties agreeing to the factual record on appeal and the brfs filed beginning in 6/2000 (almost two yrs ago), we have determined that supp briefing would be of assistance in the determination of the cause. Therefore, it is ORDERED that each side file a supp brf not to exceed 25 pgs within 28 days of the date hereof on the following question: whether it is the state of Alaska (through ADEC) or the EPA that bears the ultimate legal authority and responsibility under the Clean Air Act to determine whether an individual Prevention of Significant Deterioration permit issued by Alaska pursuant to its State Implementation Plan (SIP) meets the requirements of the Clean Air Act or the SIP. If any party desires additional oral argument in this matter, it should file a request, along with a brf statement of the reasons it believes additional argument is necessary. It is so ORDERED. (served PANEL; phoned and faxed to csls at 3:00p.m.; c.c. Front Counter) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/28/02 Filed Original and 15 copies of Respondent EPA's Supplemental brief of 25 pages pursuant to ct's order of 2/28/02; served on 3/27/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/29/02 Filed Original and 15 copies Petitioner Cominco Alaska Incorporated's supplemental brief of 25 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

4/1/02 Filed Original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (per 2/28/02 order of the ct) (PANEL) [00-70166, 00-70169, (af) [00-70169 00-70175 00-70301]

4/1/02 Filed original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) This cs is hereby resubmitted as of the date of this order. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Case resubmitted on this date to Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD. (See previous deferral of submission.) Order filed: 7/30/02. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 FILED OPINION: DENIED. (Terminated on the Merits after Oral Hearing; Enforced; Written, Signed, Published. Stephen R. REINHARDT; Kim M. WARDLAW, author; Ronald M.

	GOULD.) FILED AND ENTERED JUDGMENT. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
9/23/02	MANDATE ISSUED [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
11/4/02	Received notice from Supreme Court: petition for certiorari filed on 10/25/02 and placed on the docket 10/31/02; Supreme Court No. 02-658. (CASEFILES) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]
2/28/03	Received notice from Supreme Court, petition for certiorari GRANTED on 2/24/03. Supreme Court No. 02-658. (faxed to PANEL) (re-entered) (af) [00-70166 00-70169 00-70175 00-70301]

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

No. 00-70301

TECK COMINCO ALASKA INCORPORATED,
Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,
Respondent,

CAROL M. BROWNER, Administrator,
and CHUCK CLARKE, Regional Administrator,
Region 10, of the United States
Environmental Protection Agency,
Respondents.

DOCKET ENTRIES

DATE	PROCEEDINGS
3/16/00	FILED PETITION FOR REVIEW DOCKETED CAUSE AND ENTERED APPEARANCES OF COUNSEL, NOTIFIED RESPONDENTS OF FILING, SENT PETITIONER CIVIL APPEALS DOCKETING STATEMENT. setting schedule as follows: petitioners' opening brief is due 6/5/00; respondents' brief is due 7/5/00; petitioner's optional reply brief is due 7/18/00. [00-70301] (vt) [00-70301]
3/20/00	Filed joint mtn to consolidate (00-70166/70169/70175/70301) set coordinated briefing

schedule, and extend deadline for filing of the certified index to record; served 3/17/00. (MOATT via PROMO) [00-70166, 00-70169, 00-70175, 00-70301] [3873459] (rc) [00-70166 00-70169 00-70175 00-70301]

4/4/00 Received Respondent EPA's opposition to motion for stay and cross-motion to dismiss; served on 4/3/00. (opposition exceeds FRAP limits - motion pending - MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/6/00 Received Respondent EPA's addendum to opposition to petitioner's motion for stay and cross-motion to dismiss; served on 4/5/00. (MoAtt) [00-70166, 00-70169, 00-70175, 00-70301] (dl) [00-70166 00-70169 00-70175 00-70301]

4/17/00 Received Cominco Alaska in 00-70169, 00-70175, 00-70301 reply in opposition to motion to dismiss. served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/19/00 Received State's opposition to EPA'S motion to dismiss petitions. (served on 4/14/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

4/28/00 Received Respondents' reply in support of mtn to dismiss petitions for lack of subject matter jurisdiction; unopposed mtn of respondents for leave to file an oversized reply in support of mtn to dismiss petition for lack of subject matter jurisdiction; respondents' ntc of suppl administrative action; served on 4/27/00. (MOATT) [00-70166, 00-70169, 00-70175, 00-70301] (rc) [00-70166 00-70169 00-70175 00-70301]

5/9/00 Received Cominco Alaska opposition to motion to dismiss. (served on 5/8/00 MOATT [00-70166, 00-70169, 00-70175, 00-70301] (vt) [00-70166 00-70169 00-70175 00-70301]

6/1/00 Filed order (Harry PREGERSON, Ferdinand F. FERNANDEZ, Kim M. WARDLAW): Petitioner the State of Alaska Department of Environmental Conservation ("ADEC"), petitioner Cominco Alaska Incorporated ("Cominco") and respondents the U.S. Environmental Protection Agency, Carol M. Browner and Chuck Clarke's (EPA) 3/20/00 joint motion to consolidate petition 00-70166, 00-70169, 00-70175 and 00-70301 is granted. Petition nos. 00-70166, 00-70169, 00-70175 and 00-70301 are consolidated. Petitioner Cominco's unopposed motion for leave to file an oversized motion for stay is granted. The Clerk shall file Cominco's 3/20/00 motion for stay. Petitioner ADEC's March 31, 2000 motion for joinder in Cominco's motion for stay of the EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is granted. Respondents' March 28, 2000 motion for extension of time to file the response to petitioners' motion for stay is granted. Respondents' unopposed 4/4/00 motion for leave to file an oversized opposition to petitioners' motion for stay is granted. The Clerk shall file respondents' 4/4/00 opposition to petitioners' motion for stay, and respondents cross-motion to dismiss. The Clerk shall also file respondents' 4/6/00 addendum to its opposition to the motion for stay, and respondents' motion to dismiss. Petitioner Cominco's unopposed motion to file an oversized reply in support of its motion to dismiss is granted. The Clerk shall file the reply received 4/28/00. Petitioner Cominco's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The Clerk

shall file the surreply rec'd 5/9/00. The Clerk shall file petitioner ADEC's 4/19/00 opposition to respondents' motion to dismiss. Petitioner ADEC's motion to file a surreply in opposition to respondents' motion to dismiss is granted. The surreply was filed 5/11/00. Petitioner ADEC's motion for oral argument is denied. Petitioner Cominco's March 20, 2000 motion to stay respondent EPA's 12/10/99, 2/8/00 and 3/7/00 orders pending appeal is denied. Respondents' 4/4/00 cross-motion to dismiss is denied. The 3/20/00 joint motion of Petitioners ADEC, Cominco and respondent EPA to extend the time to file the certified index to the admin record is granted. The certified index to the admin record is due 6/26/00. Respondents' 4/3/00 motion to stay filing of the certified index to the admin record is denied as moot. The following briefing schedule shall govern these consolidated petitions for review: the opening briefs are due 6/26/00; the answering brief is due 7/26/00. Requests for extension of time will be looked upon with disfavor. All parties on a side are encouraged to join in a single brief to the greatest extent practicable. All briefs shall comply with the page and type-volume limitations set forth in FRAP 32(a)(7). If all parties on a side file a joint brief, these parties may, in accordance with Ninth Circuit Rule 28-4, timely move for enlargement of size of 5 monotype pages or 1,400 words. Requests for enlargement of size greater than 5 pages or 1,400 words will be looked upon with extreme disfavor. MOTION FOR STAY DENIED; MOTION TO DISMISS DENIED. [00-70166, 00-70169, 00-70175, 00-70301] (ft) [00-70166 00-70169 00-70175 00-70301]

6/29/00 Filed original and 15 copies Petitioner State of Alaska in 00-70166, Petitioner Cominco Alaska

in 00-70169, Petitioner Cominco Alaska Inc. in 00-70175, Petitioner Cominco Alaska in 00-70301 opening brief (Informal: n) 57 pages and five excerpts of record in 2 volumes; served on 6/26/00 [00-70166, 00-70169, 00-70175, 00-70301] (je) [00-70166 00-70169 00-70175 00-70301]

8/17/00 Filed original and 15 copies respondent EPA in 00-70166, 00-70169, 00-70175, 00-70301 in 66 pages brief, 5 Exc. in 1 vol; served on 8/16/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/7/00 Filed original and 15 copies State of Alaska, Cominco Alaska, Cominco Alaska Inc., Cominco Alaska's reply brief, (Informal: no) 46 pages; with 5 Sup. Exc of Record in 1 volume; served on 9/5/00. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/10/01 Filed Order (Deputy Clerk: gb) Petitioner's motion to expedite and decision on appeal is DENIED. Petitioner's motion to allow longer oral argument is also DENIED. NANA Regional Corporation, Inc.'s motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. NANA Regional Corporation, Inc. shall be notified by mail through its general counsel, Jacquelyn R. Luke, at 1001 E. Benson Blvd., Anchorage, AK 99508 (907)265-4148. The Native Village of Kivalina's motion for leave to file an amicus letter brief is GRANTED. This letter brief is hereby submitted. The Native Village of Kivalina shall be notified by mail through its atty and trustee, Michael J. Frank, at 1026 West 4th Ave., Ste 201, Anchorage, AK 99501 (907)276-4244x116) (faxed to PANEL and phoned counsels at 3:00p.m.) [00-

70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

1/11/01 FILED CERTIFIED COPY OF ADMINISTRATIVE RECORD ON APPEAL: 1 CARTON CONTAINING 87 DOCUMENTS.(ORIGINAL) [00-70166] [00-70166] (sd) [00-70166]

2/9/01 Received Andrew J. Doyle for Respondent EPA letter dated 2/8/01 re: current event relating to the Dec 10, 99 prevention of significant deterioration construction permit (No.9932-AC005) that Petitioner State of Alaska, Dept of Environmental Conservation issued to Petitioner Cominco Alaska, Inc. (with attachment) (faxed to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/13/01 ARGUED AND SUBMITTED TO Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD [00-70166, 00-70169, 00-70175, 00-70301] (ss) [00-70166 00-70169 00-70175 00-70301]

3/27/01 Filed Order (FOR PUBLICATION) (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Within 60 days of this order, the EPA may either (1) submit a complete administrative record which will allow this Court to review the justification for the EPA's decision to issue the Orders before us; (2) withdraw the Orders that are the subjects of these petitions or (3) file an enforcement action, (cite), in the appropriate U.S. District Court....(Please see casefile for complete text) Should the EPA opt to submit the administrative record rather than to pursue an enforcement action or to withdraw its Orders, petitioners and respondents are ordered to file, within 21 days of such submission, supplemental briefs, not to exceed 15 pgs, assessing the im-

pact, if any, (cite), on the question whether it is the EPA or ADEC which has the ultimate authority to make BACT determinations. The parties shall provide notice of the status of these proceedings to this Court within 60 days hereof. Submission of this matter is hereby vacated until further notice by this Court. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Respondent EPA's supplemental brief of 11 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

6/19/01 Filed original and 15 copies Petitioner State of Alaska, Petitioner Cominco Alaska Incorporated's supplemental brief of 13 pages, served on 6/18/01. (per 3/27/01 ct's order) (PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

8/3/01 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) The Alaska Dept of Environment Conservation's ("ADEC") motion for leave to file a response to the EPA's Hardesty Declaration is DENIED. We further order, however, ADEC and Cominco Alaska, Inc. ("Cominco") to file a response to the Hardesty Declaration that states whether they agree that the material provided by the EPA and described in the Hardesty Declaration constitutes the complete administrative record in this proceedings as both a factual and legal matter. If ADEC and Cominco contend that the materials described in the Hardesty Declaration do not constitute a complete administrative record, they are further ordered to provide legal authority for

this proposition and evidence that additional material exists. In addition, they are ordered to provide legal authority for any proposed form of relief, such as discovery, they may seek to remedy any asserted failure by the EPA to provide the complete administrative record. ADEC and Cominco are further ordered to file their responses or a combined response within 14 days of the date hereof. The EPA may file a response within 10 days thereafter. IT IS SO ORDERED. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/28/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) Having considered the recent submissions of the parties agreeing to the factual record on appeal and the brfs filed beginning in 6/2000 (almost two yrs ago), we have determined that supp briefing would be of assistance in the determination of the cause. Therefore, it is ORDERED that each side file a supp brf not to exceed 25 pgs within 28 days of the date hereof on the following question: whether it is the state of Alaska (through ADEC) or the EPA that bears the ultimate legal authority and responsibility under the Clean Air Act to determine whether an individual Prevention of Significant Deterioration permit issued by Alaska pursuant to its State Implementation Plan (SIP) meets the requirements of the Clean Air Act or the SIP. If any party desires additional oral argument in this matter, it should file a request, along with a brf statement of the reasons it believes additional argument is necessary. It is so ORDERED. (served PANEL; phoned and faxed to csls at 3:00p.m.; c.c. Front Counter) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/28/02 Filed Original and 15 copies of Respondent EPA's Supplemental brief of 25 pages pursuant to ct's order of 2/28/02; served on 3/27/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

3/29/02 Filed Original and 15 copies Petitioner Cominco Alaska Incorporated's supplemental brief of 25 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

4/1/02 Filed Original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (per 2/28/02 order of the ct) (PANEL) [00-70166, 00-70169, (af) [00-70169 00-70175 00-70301]

4/1/02 Filed original and 15 copies Petitioner State of Alaska in 00-70166 supplemental brief of 10 pages, served on 3/28/02. (Fedex to PANEL) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Filed Order (Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD) This cs is hereby resubmitted as of the date of this order. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 Case resubmitted on this date to Stephen R. REINHARDT, Kim M. WARDLAW, Ronald M. GOULD. (See previous deferral of submission.) Order filed: 7/30/02. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

7/30/02 FILED OPINION: DENIED. (Terminated on the Merits after Oral Hearing; Enforced; Written, Signed, Published. Stephen R. REINHARDT; Kim M. WARDLAW, author; Ronald M.

GOULD.) FILED AND ENTERED JUDGMENT. [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

9/23/02 MANDATE ISSUED [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

11/4/02 Received notice from Supreme Court: petition for certiorari filed on 10/25/02 and placed on the docket 10/31/02; Supreme Court No. 02-658. (CASEFILES) [00-70166, 00-70169, 00-70175, 00-70301] (af) [00-70166 00-70169 00-70175 00-70301]

2/28/03 Received notice from Supreme Court, petition for certiorari GRANTED on 2/24/03. Supreme Court No. 02-658. (faxed to PANEL) (re-entered) (af) [00-70166 00-70169 00-70175 00-70301]

COMINCO ALASKA, INCORPORATED.
INDEX TO THE ADMINISTRATIVE RECORD

A. EPA NOTICES AND ORDERS

Docmt. No.	Date	Document
1	12/10/99	Findings of Noncompliance and Order w/cover letter to Michele Brown, AK. Dept. of Environmental Conservation (ADEC) from Chuck Findley, U.S. Environmental Protection Agency (EPA)
2	12/10/99	Three fax confirmation sheets sending Findings of Noncompliance and Order to Michele Brown, Cam Leonard, Tom Chapple and Rick Albright
3	2/8/00	Letter to Michele Brown, ADEC from Chuck Findley, EPA re: PSD permit and Finding of Noncompliance and Order [On file with Court as EPA's Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 13.]
4	2/8/00	Three fax confirmation sheets to Tom Chapple, Michele Brown, Cam Leonard sending 2/8/00 letter
5	2/8/00	Administrative Order w/cover letter to Norman Maloney, Reg. Agent for Cominco from Chuck Findley, EPA
6	2/8/00	Six fax confirmation sheets to Tom Chapple, Michele Brown, Larry Hartig, John Key, Cameron Leonard, and Doug Horswell sending Administrative Order

Docmt. No.	Date	Document
7	3/7/00	Amended Administrative Order w/cover letter to Robert Connery, Esq. from Chuck Findley, EPA
8	3/7/00	Letter to Norman Mahoney sending Administrative Order
9	3/7/00	Fax confirmation sheet to John Key, Larry Hartig, Bob Connery, Michel [sic] Brown, Marcia Combes, Karen Blanchard, Greg Foote, and Carol Holmes
10	4/25/00	Letter to Michele Brown, ADEC from Chuck Findley, EPA re: withdrawal of 12/10/99 Order [On file with Court as EPA's Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 23.]

B. ADEC ANALYSIS, PROPOSED AND FINAL PERMITS

Docmt. No.	Date	Document
11	7/27/94	Letter to Charlotte MacCay, Cominco from Leonard Verrelli, ADEC sending the findings of ADEC re: permit
12	3/27/96	Letter to Jack Coutts, ADEC from D. J. Charlton, Cominco re: a production rate increase
13	4/2/96	Letter to D. J. Charlton, Cominco from Alfred Bohn, ADEC re: Pre-Construction Waiver for Production Rate Increase
14	12/4/96	ADEC Permit to Operate No. 9332-AA003, Amendment No. 2

Docmt. No.	Date	Document
15	1/17/96 [sic]	ADEC Air Quality Control Permit to Operate No. 9511-AA007 Kensington Mine
16	5/19/98	Letter to Paul Dusenbury, Cominco from Robert Cannone, ADEC re: tests on gyratory crusher
17	5/4/99	ADEC's Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005 [On file with Court as EPA's Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 5.]
18	5/4/99	ADEC's Air Quality Construction Preliminary Permit No. 9932-AC005
19	7/29/99	Memo to Jim Baumgartner, ADEC from John Stone, ADEC re: Excluded Pre-Construction Monitoring
20	8/5/99	Memo to Tom Chapple, ADEC from Jim Baumgartner, ADEC re: Cominco Red Dog Mine Particulate Matter Impacts from the Production Rate Increase Project and Associated Activities
21	8/10/99	Memo to Jim Baumgartner, ADEC from Brian Renninger, ADEC re: Response to BACT Section of Appendix A of Cominco's Comments on Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005, Entitled Presentation to ADEC of Major Discretionary Air Quality Issues Pending Decision at Cominco's Red Dog Mine

Docmt. No.	Date	Document
22	8/11/99	Memo to Tom Chapple, ADEC from John Stone, ADEC re: review of ADEC's preliminary decision for BACT
23	8/12/99	Memo to Cominco Red Dog Mine File from Jeff Anderson, ADEC re: Owner-Requested Limits and Ambient Impacts for Specified Stack Parameters
24	8/13/99	Memo to John Stone from Bill Walker, ADEC re: Particulate for 5 MW Diesels
25	8/13/99	Memo to John Stone from Brian Renninger, ADEC re: Follow-up Recommendation for the Removal of the 109,660,000 kW-hr Limit from Four of Cominco's Wartsila 5 MW Generator Sets
26	8/13/99	Cominco Red Dog Mine Power Plant NOx Emission Comparison PSD BACT Options
27	8/19/99	Memo to John Stone from Jim Baumgartner, ADEC re: Consideration of Cominco's Request to Revise the Carbon Monoxide Emission Limit for Wartsila Sources MG-1 Through MG-6 and MG-17
28	8/23/99	ADEC's Draft Response to Comments, Cominco Alaska Red Dog Mine Production Rate Increase Project Air Quality Construction Permits No. 9932-AC005

Docmt. No.	Date	Document
29	9/1/99	ADEC's Final Draft Technical Analysis Report for Air Quality Control Construction Permit, No. 9932-AC005
30	9/3/99	ADEC Air Quality Construction Permit Final Draft
31	9/20/99	Cominco Alaska Inc. Comments on Mine Site Air Permit, TAR and Response to Comments
32	12/10/99	ADEC's Air Quality Construction Permit No. 9932-AC005 [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 12.]
33	12/10/99	ADEC's Final Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005 [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 10.]
34	12/10/99	ADEC's Response to Comments Cominco Alaska Red Dog Mine Production Rate Increase Project Air Quality Construction Permit No. 9932-AC005

C. COMINCO PERMIT APPLICATION AND RELATED SUBMISSIONS

Docmt. No.	Date	Document
35	12/97	Appendix C, Source Test Results from Cominco's Application for Air Quality Control Operating Permit (Title 5)

Docmt. No.	Date	Document
36	6/98	Application for an Air Quality Control Construction Permit: Production Rate Increase for Red Dog Mine
37	10/98	Air Quality Control Construction Permit: Response to 7/27/98 ADEC Request for More Information for Red Dog Mine
38	11/98	Air Quality Control Construction Permit: Response to 11/13/98 ADEC Request for More Information for Red Dog Mine
39	1/99	Air Quality Control Construction Permit: Response to 12/7/98 ADEC Request for More Information for Red Dog Mine
40	2/99	Amendment and Supplemental Submission for the 6/98 Production Rate Increase Permit Request for Red Dog Mine
41	2/99	Air Quality Control Construction Permit: Response to 1/28/99 ADEC Request for More Information for Red Dog Mine
42	4/15/99	Letter to Jim Baumgartner, ADEC from Al Trbovich, Hoefler Consulting Group re: Amendment III for the 6/98 Production Rate Increase Permit Request
43	6/99	Comments on Draft Air Quality Control Construction Permit No. 9932-AC005

Docmt. No.	Date	Document
44	6/99	Comments on Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005 for Red Dog Mine
45	6/22/99	Presentation to ADEC of Major Discretionary Air Quality Issues Pending Decision at Cominco's Red Dog Mine

D. CORRESPONDENCE

Docmt. No.	Date	Document
46	6/2/99	Letter to Jim Baumgartner, ADEC from John Notar, Department of Interior (DOI) sending comments on proposed construction permit [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 4.]
47	7/29/99	Letter to Tom Chapple, ADEC from Anita Frankel, EPA re: EPA's concerns about proposed permit
48	9/15/99	Letter to Tom Chapple, ADEC from Anita Frankel, EPA re: EPA's concerns about final draft permit [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 6.]

Docmt. No.	Date	Document
49	9/20/99	Letter to Anita Frankel, EPA from John Bunyak, DOI re: DOI's concerns regarding proposed construction permit [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 11.]
50	9/28/99	Letter to Tom Chapple, ADEC from Anita Frankel, EPA sending EPA's staff review of ADEC's Technical Analysis Report and PSD Permit for the Production Rate Increase [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 7.]
51	10/8/99	Letter to Anita Frankel, EPA from Charlotte MacCay, Cominco re: comments on EPA's Review of Cominco PSD permit [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 8.]
52	10/18/99	Letter to John Key, Cominco from Robert Connery, Holland & Hart, LLP re: EPA Usurpation of Alaska's Program for the PSD
53	10/29/99	Memo to Chuck Findley, EPA from Charlotte MacCay, Cominco re: EPA's Oversight of the ADEC PSD Permit for the Red Dog Mine, including memo to EPA from Bob Connery and Larry Volmert, Holland & Hart re: oversight

Docmt. No.	Date	Document
54	11/3/99	Letter to Michelle [sic] Brown, ADEC from Robert Connery, Holland & Hart re: Alaska's Role in PSD
55	11/10/99	Letter to Michele Brown, ADEC from Chuck Findley, EPA re: 10/21/99 mtg with Cominco [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 9.]
56	No date	Letter to Chuck Clark [sic], EPA from John Key, Cominco re: 11/12/99 meeting on air permitting issues and sending economic information
57	11/19/99	Letter to Charles Clarke, EPA from Congressman Don Young re: permit for Cominco Alaska's Red Dog Mine expansion
58	12/21/99	EPA's response to Congressman Young
59	12/7/99	Faxed memo to Chuck Clark [sic], EPA from Charlotte MacCay, Cominco sending 12/6/99 opinion of Robert Connery and Lawrence Volmert, Holland & Hart re: EPA Authority to Bring Enforcement Action in Federal District Court under Sec. 167 Without Prior Issuance of Administrative Order
60	12/27/99	Letter to Eric Yould, Alaska Rural Electric Cooperative Association (ARECA) from Michele Brown, ADEC responding to concerns of rural utilities

Docmt. No.	Date	Document
61	1/5/00	Letter to Chuck Clarke and Chuck Findley, EPA from Michele Brown, ADEC re: concern over EPA's letter and Order prohibiting Alaska from issuing a PSD permit
62	1/12/00	Letter to Erick Yould, ARECA from Chuck Findley, EPA, clarifying EPA's position re: Prevention of Significant Deterioration (PSD) permits and applicability of Best Available Control Technologies (BACT)
63	1/14/00	Letter to Carol Browner, EPA from Gov. Tony Knowles, State of Alaska re: requesting review of EPA's Order
64	2/16/00	Letter to Chuck Clarke, Chuck Findley, Doug Hardesty from Robert Connery re: Request for Stay [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 1.]
65	3/1/00	Letter to Julie Matthews, EPA from Larry Hartig re: Generator No. 7 (MG-17) Construction Schedule [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 22.]
66	3/14/00	Ltr to Charles Clarke, EPA from John Key, Cominco re: request for a stay
67	3/14/00	Ltr to Julie Matthews, EPA from Lawrence Hartig, Esq. re: filing a motion for stay

Docmt. No.	Date	Document
68	4/26/00	Ltr to John Key, Cominco from Barbara McAllister, EPA re: construction schedule and request for stay [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 24.]

E. EPA GUIDANCE AND BACT PROCESS

Docmt. No.	Date	Document
69	12/14/83	Memo to Regional Counsels, et al., EPA from Michael Alushin and Edward Reich, EPA re: Guidance on Enforcement of Prevention of Significant Deterioration Requirements under the Clean Air Act
70	7/15/88	Procedures for EPA to Address Deficient New Source Permits under the Clean Air Act [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 20.]
71	10/90	Draft New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting

Docmt. No.	Date	Document
72	1/22/93	Memo to Scott Fulton, EPA from Raymond Ludwiszewski, EPA re: EPA Enforcement Authority with Respect to Sources Based on a Finding of a State's Failure to Comply with New Source Requirements: The Effect of the 1990 Amendments-- Legal Opinion [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 16.]
73		Tables re: NOx controls on engines
74		Permit for Fuel Burning Equipment, State of Connecticut, Department of Environmental Protection, Bureau of Air Management

F. SIP APPROVALS

Docmt. No.	Date	Document
75	7/5/83	Approval and Promulgation of Implementation Plans; Alaska, Final Rule, 48 Fed. Reg. 30,623 (1983)
76	4/24/84	Approval and Promulgation of Implementation Plans; Alaska, Final Rule, 49 Fed. Reg. 17,497 (1984)
77	4/26/91	Approval and Promulgation of State Implementation Plans: Alaska, Final Rule, 56 Fed. Reg. 19,284 (1991)
78	2/16/95	Approval and Promulgation of Implementation Plans: Alaska, Direct Final Rule, 60 Fed. Reg. 8943 (1995)

Docmt. No.	Date	Document
79	11/18/98	Approval and Promulgation of State Implementation Plans; Alaska, Final Rule, 63 Fed. Reg. 63,983 (1998)

G. MISCELLANEOUS

Docmt. No.	Date	Document
80	5/11/94	Delegation 7-37, CAA Administrative Enforcement Actions: New Source Review (NSR) Orders
81	5/11/94	Delegation 7-38, CAA Prevention of Significant Deterioration: Administrative Enforcement
82	3/21/96	Delegation R10 1265.1, CAA Regulatory Enforcement Orders Enforcing NSR and PSD Requirements
83	1998	Cominco's Annual Report, Solid Progress in a Challenging Year
84	9/8/99, 2/3/00	Information from Cominco's website
85		Materials provided by Cominco at 10/21/99 meeting: - Info on PSD permitting for 1988, 1994 and 1999 - Presentation to Alaska Department of Environmental Conservation of Major Discretionary Air Quality Issues Pending Decision at Cominco's Red Dog Mine - Legal research materials

Docmt. No.	Date	Document
86	10/26/99	Newspaper article from Anchorage Daily News on Cominco Ltd. [On file with Court as EPA Opposition to Motion to Stay and Cross-Motion to Dismiss, Att. 21.]
87	2/2/00	Delegation of Authority, Cominco Red Dog Mine

ALASKA DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
Juneau, Alaska

PRELIMINARY TECHNICAL ANALYSIS REPORT

For Air Quality Control Construction Permit
No. 9932-AC005

Cominco Alaska, Inc.
Prevention of Significant Deterioration
Red Dog Mine Production Rate Increase

May 4, 1999

Prepared by:
Alaska Department of Environmental Conservation
Air Quality Maintenance Section
410 Willoughby Avenue, Suite 105
Juneau, AK 99801

In conjunction with:
Hoefler Consulting
1205 East International Airport Road, Suite 201
Anchorage, AK 99578

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY 3
2. INTRODUCTION 7
   - 2.1 PROJECT LOCATION 8
   - 2.2 EMISSION SOURCES 8
   - 2.3 PSD APPLICATION REQUIREMENTS 12
3. EMISSION STANDARDS 15
   - 3.1 NEW SOURCE PERFORMANCE STANDARDS 15
   - 3.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS 20
   - 3.3 ALASKA EMISSION STANDARDS 21
4. BEST AVAILABLE CONTROL TECHNOLOGY 29
   - 4.1.1 Mechanisms of NOx Formation 31
   - 4.1.2 NOx Control Methods 33
   - 4.4 CONTROL OF PARTICULATE MATTER (PM-10) 48
   - 4.4.1 Mechanism of PM-10 Formation 48
   - 4.4.2 PM-10 Control Methods 49
   - 4.3 CONTROL OF SULFUR DIOXIDE (SO_2) 56
   - 4.3.1 Mechanisms of SO_2 Formation 56
7. PERMIT ADMINISTRATION 83
   - 7.1 Standard Conditions 83
   - 7.3 Preliminary Decision 85
8. CONCLUSIONS 87
9. REFERENCES 89

APPENDIX A Tables from the Permit Application

APPENDIX B Control Costs for BACT

APPENDIX C Coastal Zone Project Questionnaire

ABBREVIATIONS AND ACRONYMS

BACT	Best Available Control Technology
CEM	Continuous Emission Monitor
CFR	U.S. Code of Federal Regulations
CO	Carbon Monoxide
DEC	Alaska Department of Environmental Conservation
EGR	Exhaust Gas Re-circulation
EPA	U.S. Environmental Protection Agency
ESP	Electrostatic Precipitator
FITR	Fuel Injection Timing Retard
hp	Horsepower
hr	Hour
H_2S	Hydrogen Sulfide
ISO Conditions	288K, 60 pct relative humidity and 101.3 kilopascals pressure
KW	Kilowatts
LAER	Lowest Available Emission Rate
MMBtu	Million British thermal units
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NSCR	Non-Selective Catalytic Reduction
NSPS	New Source Performance Standards
NO	Nitric Oxide
NOx	Oxides of nitrogen
NO_2	Nitrogen Dioxide
OLM	Ozone Limiting Method
OSHA	Occupational Safety and Health Administration
PM	Particulate matter
PM-10	Particulate matter (10 micrometers or less in size)
ppmdv	Parts per million, dry volume basis
PSD	Prevention of Significant Deterioration
SCO	Selective Catalytic Oxidation
SCR	Selective Catalytic Reduction

SNCR	Selective Non-Catalytic Reduction
SO_2	Sulfur Dioxide
TSP	Total suspended particulate (30 micrometers or less)
VOC	Volatile organic compounds
$\mu g/m^3$	Microgram per cubic meter

* * *

4. BEST AVAILABLE CONTROL TECHNOLOGY

The Department's goal for the best available control technology (BACT) review is to evaluate available technologies, identify BACT for the project's emission sources, and establish emission or operational limits which represent BACT. This review is conducted in accordance with State and federal rules and guidelines. In this section, the Department evaluates the available control technologies for each emission source and selects BACT. In addition, the Department assesses the level of monitoring, record keeping, and reporting necessary to ensure the applicant applies BACT.

Under the State of Alaska's PSD Provisions of the Air Quality Control Regulations, an applicant subject to preconstruction review must show that BACT will be installed and used for each new or modified source. BACT is defined as an emission limit that represents the maximum reduction achievable for each regulated air contaminant subject to preconstruction review under the PSD provisions of the Clean Air Act (CAA). For this project, BACT evaluation is required for the following contaminants: oxides of nitrogen (NOx), particulate matter (PM-10), and volatile organic compounds (VOC).

Application of BACT will not result in emission of any pollutant which would exceed the emissions allowed by any applicable federal standard listed in 40 CFR, Part 60 NSPS, and 40 CFR 61 National Emission Standards for Hazardous Air Pollutants (NESHAPS).

On a case-by-case basis, the Department, taking into account energy, environmental, and economic impacts, determines emission limits for new sources or modifications through the application of production, process, or available control systems and techniques. The Department identifies available control technology and evaluates the most effective control measure available for a stationary source for each pollutant.

The Department may propose a balanced approach reducing all air contaminants in an optimized manner, rather than achieving the maximum degree of emissions reduction for a single air contaminant.

The Department evaluates economic feasibility of BACT by comparing the control cost of each available control technology. If the Department determines that technological or economic constraints of the control system for a particular pollutant would make the imposition of an emission standard infeasible, the Department may prescribe a design, equipment, work practice, operational standard, or combination, to satisfy the requirement for BACT. The Department will set forth the emission reduction achievable through implementation of such design, equipment, work practice, or operation.

As part of a complete application, the applicant must provide an adequate demonstration that the proposed emission control system represents BACT for the project. The applicant prepares an economic comparison of available technologies by summing the annualized capital and operational costs for a given technology, and dividing the cost sum by the air contaminant emission rate reduction expected for that technology. This results in an incremental cost for comparison with other technologies analyzed, in terms of cost per ton of air contaminant reduced. The lower the cost per ton, the less expensive it is to employ that technology. The Department determines the economic feasibility threshold that reflects the appropriate site-specific level of control for the pollutant and new sources.

The methodology Cominco used to identify BACT is the five-step "top-down" methodology set forth in the U.S. EPA's proposed *New Source Review Rule Revisions* (EPA 1990). The first step is to survey alternative control techniques and identify all "available" control options. An available control option is a practical air pollution control technology or technique to the emission unit and pollutant under evaluation.

To assist in identifying available controls, Cominco and the Department reviewed the available controls listed on EPA's RACT/BACT/LAER (RBLC) Clearinghouse bulletin board where permitting agencies nationwide have listed the BACT control technologies imposed within the past five years.

The second step in the top-down approach evaluates the technical feasibility of each available control option based on source-specific factors. The Department deems as technically infeasible those control options that would clearly result in technical difficulties that preclude their successful application.

Step three determines the effectiveness of control alternatives for all options not eliminated in step two. The Department ranks the control options in order of overall control effectiveness for the pollutant under review in a "top-down" manner.

Step four considers the energy, environmental, and economic impacts of control options. The step begins with the top-ranked, technically-feasible control alternative. If the most effective control option is shown to be inappropriate due to adverse economic, environmental, or energy impacts, then it is eliminated and the next most stringent alternative is evaluated. If the most stringent technology is selected as BACT, it is not necessary to continue the analysis.

Finally, under step five, the Department proposes the most effective control option not eliminated in step four as BACT for the pollutant and emissions unit under review.

All BACT requirements, with limits, monitoring, record keeping, and reporting obligations are incorporated in Condition XI of the permit. Table 4-1 below summarizes the BACT proposed by the Department.

Table 4-1 Department BACT Limits

Equipment	NOx	CO	PM-10	VOC
MG-5 & MG-17	11 gr/kW-hr	N/A[1]	2.6 lb./hr, 10% opacity	GOP
MG-11	GOP[2]	GOP	0.05 gr/dscf, 20% opacity	
MG-12	GOP	GOP		
MG-13	GOP	GOP		
MC-1	N/A	N/A		
MG-14	GOP	GOP		
MG-15	GOP	GOP		
MG-l6	GOP	N/A		
MH-1, MH-2 & MH-3	0.035 lb/MMBtu	GOP	N/A	
MH-4, & MH-5	GOP	GOP	N/A	
MH-6 through MH-36	GOP	GOP	N/A	
MH-37 through MH-48	GOP	N/A	GOP	
MI-3	GOP	N/A	10% Visible Emissions	
MD-4	N/A	N/A	0.01 gr/dscf	NA
MD-6 & MF-3	N/A	N/A	0.01 gr/dscf	N/A
MT-1 & MT-2	N/A	N/A	N/A	Subpart Kb
MT-3	N/A	N/A	N/A	
MF-1	N/A	N/A	N/A	N/A

MF-5	N/A	N/A	Chemical Stabilization and Water-ing	N/A
MF-6	N/A	N/A	quarry-liquid application where practical, drilling - liquid application	N/A
MF-7	N/A	N/A	Covering, revegetation, watering	N/A
MF-8 & 9	No Control	No Control	No Control	No Control
MF-10	N/A	N/A	N/A	N/A
MF-11	N/A	N/A	LL and OOO	N/A
MF-12	N/A	N/A	OOO	N/A

[1] N/A - Not Applicable

[2] GOP - Good Operation Practices

4.1 BACT DETERMINATION FOR NOx

This facility is currently permitted to emit greater than 250 tons per year of NOx, and is therefore classified as a PSD Major facility under 18 AAC 50.300(c)(1). The proposed modification will increase allowable NOx emissions in excess of the 40 ton per year PSD applicability threshold specified in 18 AAC 50.300(h)(3)(b)(ii). Therefore, the Department will impose NOx BACT for the proposed NOx emission sources.

The Department evaluated several NOx control methods as BACT for the following sources: large diesel-fired engines,

small diesel-fired engines, small heaters, and the modular waste incinerator. The specific options and evaluation results are summarized in Tables 4.1-1 to 4.1-4, and discussed in detail in this section.

Table 4.1-1 Summary of NOx BACT (Large Diesel-Fired IC Engines)

Available Controls	Technically Feasible	Economically Feasible	BACT
Selective Catalytic Reduction	Yes	Yes	No[1]
Non-Selective Catalytic Reduction	No	N/A[2]	N/A
Direct Water Injection	Yes	No	No
Low NOx Modification	Yes	Yes	Yes[1]
Fuel Injection Timing Retard	Yes	Yes	No
Operation per Design	Yes	Yes	No

[1] While SCR is a technically and economically feasible control technology, Low NOx control technology was chosen as BACT due to other considerations. See the discussion below for the details.

[2] N/A - Not Applicable

Table 4.1-2 Summary of NOx BACT (Small Diesel-Fired IC Engines)

Available Controls	Technically Feasible	Economically Feasible	BACT
Selective Catalytic Reduction	No	N/A[1]	N/A
Non-Selective Catalytic Reduction	No	N/A	N/A
Direct Water Injection	No	N/A	N/A
Fuel Injection Timing Retard	Yes	No	No
Lean Burn Combustion	No	N/A	N/A
Turbocharger and After-cooler	Yes	Yes	No[2]
Operation per Design	Yes	Yes	Yes

[1] N/A - Not Applicable

[2] All of the engines are fitted with turbochargers as part of their design. Two of the engines, MG-14 and MG-15, are fitted with aftercoolers as part of their design. ADEC does not consider retrofitting the smaller engines with aftercoolers technically-feasible, due to their small size.

Table 4.1-3 Summary of NOx BACT (Small Heaters)

Available Controls	Technically Feasible	Economically Feasible	BACT
Low NOx Burner/Flue Gas Recircu-lation	Yes	No	No[1]
Staged Combustion Air	No	N/A[2]	N/A
Selective Catalytic Reduction	No	N/A	N/A
Operation Per Design	Yes	Yes	Yes[1]

[1] LNB/FGR is BACT for heaters MH-l, MH-2 due to their larger size.

[2] N/A - Not Applicable

Table 4.1-4 Summary of NOx BACT (Incinerator MI-3)

Available Controls	Technically Feasible	Economically Feasible	BACT
Staged Air Combustion	Yes	Yes	Yes[2]
Selective Non-Catalytic Reduction	No	N/A[1]	N/A
Selective Catalytic Reduction	No	N/A	N/A
Operation Per Design	Yes	Yes	Yes[2]

[1] N/A - Not Applicable

[2] Staged air combustion is integral to the incinerators design.

4.1.1 Mechanisms of NOx Formation

Combustion is defined as the rapid chemical combination of oxygen with combustible elements of a fuel. Combustion produces heat that can be manipulated to generate power. Most fuels have three combustible elements: carbon, hydrogen, and sulfur, which unite with oxygen from atmospheric air to produce heat. Atmospheric air is a mixture that contains roughly 79% nitrogen and 21% oxygen by volume. Nitrogen present in the combustion process sometimes combines with oxygen, forming oxides of nitrogen.

There are several types of oxides of nitrogen formed during the combustion process, but only two types occur in significant quantities: nitric oxide--NO, and nitrogen dioxide--NO_2. In stationary source combustion, most of the NOx formed is nitric oxide (NO), which can oxidize in the atmosphere to form NO_2, a regulated air contaminant. At high temperatures, NO formation is favored almost exclusively

over NO_2 formation, and the rate of NO_2 dissociation to NO is favored by the mechanism:

$$NO_2 + O + \text{heat} \leftrightarrow NO + O_2$$

After the flue gas exits the stack, the entrained NO may be oxidized by atmospheric ozone to form NO_2. Other complex atmospheric reactions with NO and NO_2 can also occur.

There are three mechanisms for NOx formation during combustion of certain fossil fuels. These formation mechanisms are thermal, fuel-bound, and prompt NOx. A brief discussion of each mechanism follows.

Thermal NOx Formation

The predominant mechanism in combustion reactions is thermal fixation of the atmospheric nitrogen at elevated temperatures, usually greater than 2800°F, known as thermal NOx. Production of thermal NOx is an exponential function of the flame temperature, and a linear function of the time the hot gas mixture is at that flame temperature. This mechanism follows the Zeldovich reactions, with three predominant paths for NOx formation in combustion:

$$(1)\ N_2 + O \leftrightarrow NO + N$$

$$(2)\ N + O_2 \leftrightarrow NO + O$$

$$(3)\ N + OH \leftrightarrow NO + H$$

Note that reaction (1), which is highly temperature-dependent, provides the atomic nitrogen (N) necessary for reactions (2) and (3). Note further that the reverse reactions are not favored by the presence of molecular oxygen. Therefore, in the oxidizing environment that normally prevails downstream from the actual combustion zone due to the presence of excess combustion air, the NO that has been formed is essentially fixed.

Fuel-Bound NOx

Chemically-bound nitrogen in the fuel is known as fuel-bound nitrogen. The oxidation mechanism is dependent on fuel-bound nitrogen content, fuel properties, and the stoichiometric conditions present during combustion. The most significant factors attributing fuel-bound NOx formation are chemically fuel-bound nitrogen content, and the fuel-to-air ratio during the early stages of combustion when fuel-bound nitrogen is liberated from the fuel.

As the chemically-bound nitrogen in the fuel enters the flame zone, the fuel is burned into small reactive, nitrogenous organic molecules which react with oxygen to form NO. In a reduction environment where insufficient oxygen is present for complete combustion, such as the fuel-rich zone of combustion, the nitrogenous fuel fragments encounter and react with each other, and convert the fuel-bound nitrogen to molecular nitrogen (N_2).

Fuel-bound nitrogen can be a significant source of NOx emissions from fossil fuels such as residual oil and coal, but significantly less fuel-bound nitrogen is contained in natural gases. The Department typically uses the most conservative technique to estimate NOx emissions due to fuel-bound nitrogen--to assume that all nitrogen in the fuel is converted to NOx during combustion.

Prompt NOx

Prompt NOx is produced by the formation of an intermediary such as hydrogen cyanide (HCN), through the reaction of nitrogen radicals and hydrocarbons (HC),

$$NO + HC + H_2 - HCN + H_2O$$

followed by the oxidation of the HCN to NO. The formation of prompt NOx has a weak temperature dependence and a short lifetime of several microseconds. It is only significant in very fuel-rich flames, which are inherently low NOx emitters.

4.1.2 NOx Control Methods

This section describes the control technologies that may be available to reduce NOx emissions from one or more of the source categories listed by the applicant. The Department's evaluation of the availability and effectiveness of these controls for each of the applicant's source categories is provided in Sections 4.1.3 through 4.1.5.

Selective Catalytic Reduction (SCR)

Selective Catalytic Reduction (SCR) is a potential emission control technology for turbines and other internal combustion sources. SCR systems use ammonia to selectively reduce NOx to N_2. This technology reduces both thermal and fuel-bound NO_2. SCR injects ammonia or urea into the exhaust before the exhaust enters a catalyst bed made with vanadium, titanium, or platinum. The reduction reaction occurs when the flue gas passes over the catalyst bed where the NOx and ammonia combine to become nitrogen, oxygen, and water as follows:

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$$

$$2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O$$

The required catalyst bed temperature is dependent on the type of catalyst used, and must be maintained within a narrow temperature range for effectiveness. Manufacturers tailor their catalyst design for the temperature range expected. A metal oxide catalyst, such as vanadium or titanium is effective between approximately 600 °F and 750 °F. For a wider temperature range, zeolite catalysts have been effective in the 800 °F to 1200 °F temperature range.

Temperature dramatically affects NOx reduction because the catalyst exhibits optimum performance within a narrow temperature range. Below this optimum range, the catalyst activity is greatly reduced, allowing unreacted ammonia to "slip" through. This slip results in increased ammonia concentration in the exhaust gas that is discharged into the

atmosphere. Above the range, ammonia begins to be oxidized to form additional NOx. Further excessive temperatures may damage the catalyst.

In addition to tight operating temperature controls, the SCR process requires good control and continual adjustment of the ammonia injection rate to match the rate of NOx formation. An ammonia deficiency causes nitric oxide to react preferentially with the excess oxygen, while an ammonia surplus leads to additional ammonia slip.

Exposing a catalyst to sulfur-bearing fuels and ammonia forms ammonia salts. These salts foul the surface of the catalyst, rendering it useless and causing premature replacement. Sulfur-tolerant SCR catalysts are available, but are composed of vanadium pentoxide, a hazardous substance. These catalysts are still susceptible to some ammonium sulfate fouling. The spent vanadium pentoxide catalyst would have to be shipped off-site for disposal. To address this concern, many catalyst vendors operate exchange programs where spent catalysts are exchanged for new catalysts at a reduced price. Exchange programs alleviate customer waste disposal concerns and allow the vendor to recycle the precious metals that make up many of the catalysts.

In summary, successful operation of an SCR system occurs if the catalyst is exposed to an exhaust stream that is not an oxidizing environment. The injection of a reducing agent, most commonly ammonia (NH_3), causes NO to preferentially react with the agent to form nitrogen and water, rather than reacting with the excess oxygen. SCR requires a narrow temperature range to achieve optimum catalytic performance. SCR may be used in conjunction with reductions from steam or water injection, or combustion modifications.

Carefully designed SCR systems achieve NOx reduction efficiencies as high as 90%, with ammonia slip vendor guarantees of no greater than 10 ppm available. Conservative reductions are 80% control efficiency. This technology

has not been applied in Alaska, though the Department knows of no technical difficulty particular to Alaska that would prevent SCR use.

Non-Selective Catalytic Reduction (NSCR)

Non-selective Catalytic Reduction (NSCR), sometimes called a three-way catalyst, reduces NOx emissions 80% to 90% at a temperature between 800 and 1200 degrees F. NSCR systems use a mixture of platinum and rhodium catalyst, and carbon monoxide and hydrocarbons (CH_4) as reducing agents contained in the flue gas, forming N_2, H_2O and carbon dioxide. The chemical reaction process is not fully understood, but can be represented in the following basic formulas:

$$CH_4 + 4NO_2 \rightarrow CO_2 + 4NO + 2H_2O$$

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

$$CH_4 + 4NO_2 \rightarrow CO_2 + 2N_2 + 2H_2O$$

$$2CO + 2NO \rightarrow 2CO_2 + N_2$$

$$2H_2 + 2NO \rightarrow 2H_2O + N_2$$

NSCR is only effective in a fuel-rich, preferably gas-fired, non-variable load combustion. The air-to-fuel ratio must be at or close to stoichiometric to provide adequate concentration of reducing agents in the exhaust gas. Stoichiometric combustion produces exhaust gas nearly depleted of oxygen (less than four percent oxygen). The inability to control air-to-fuel ratio for varying loads limits NSCR application. NSCR is best known for its application in reducing NOx from automobile exhaust. NSCR uses no reactant for the control of NOx.

Selective Non-Catalytic Reduction (SNCR)

Selective non-catalytic reduction (SNCR) is a thermal denitrification process that also involves the injection of ammonia or urea into the exhaust gases. The ammonia or urea reduces NOx to N_2 within a narrow temperature range of

1600 to 2000°F without a catalyst. At these temperatures, 80 to 90% NOx emission reduction can be achieved. Since the optimum reaction temperature is very high, the applicability of SNCR is primarily restricted to large industrial boilers.

As with SCR, SNCR requires transportation, handling, and storage of ammonia, a hazardous substance. There is a potential of ammonia slip in the exhaust gas, increasing ammonia levels in the ambient air. The other technical problem for most applications is the physical ammonia or urea injection location. For equipment operating at various loads, the proper injection temperature "window" physically moves within the combustion zone and the exhaust ductwork, requiring multiple injection locations.

Direct Water Injection/Low NOx Modification

Direct Water Injection lowers the peak flame temperature by providing a heat sink that absorbs some of the heat of the reaction, thereby reducing peak flame temperature and the resultant rate of NOx formation. The water injected into the engine is required to be extremely pure or the engine will require significant amounts of maintenance and repair. The manufacturer of Cominco's large diesel-fired engines, usually installs Direct Water Injection on engines with Low NOx modification packages. The Low NOx modification package is described below. Cominco has verified that a reverse osmosis water treatment and injection system would be necessary for this technology to be considered. A NOx reduction of 40% to 60% may be expected with this combined technology. Wartsila expects NOx emissions of approximately 6 grams per KW - hour with DWI controls installed on the 5000 kW generators. The manufacturer expects no additional fuel consumption when retrofitting the 5000 kW generators with both DWI and Low NOx Modification. If only DWI was retrofit, a 3% increase in fuel consumption is anticipated.

DRY CONTROLS

Dry controls incorporate an efficient combustion chamber design, staged combustion, and/or use of a lean fuel-to-air ratio. The use of lean fuel-to-air ratio results in lowered average combustion temperatures, reducing the formation of thermal NOx. Thermal NOx formation tends to be maximum at the high temperatures associated with stoichiometric conditions. Combustion chamber design changes may also reduce peak temperatures, thus limiting thermal NOx formation. The design techniques for this "dry low NOx" (DLN) combustion technology include staged combustion and/or use of a lean pre-mix combustion configuration. Specific examples are provided below.

Low NOx Modification

For the main generators, Wartsila has developed a retrofit package called a Low NOx Modification. This modification is based on a higher combustion air temperature at initiation of the injection cycle, which drastically reduces the ignition delay. The retrofit also retards the fuel injection start and has a shorter injection period that makes combustion take place at the optimal point with respect to efficiency. It improves fuel atomization, and modifies combustion space for improved mixing of air and fuel. The design requires replacement of the piston crowns, piston ring set, fuel injection valve, cylinder head, cylinder liner, and antipolishing ring. The Low NOx modification is expected to reduce NOx emissions approximately 30% from the Wartsila engines. The low NOx modification incorporates fuel injection timing retard as described below.

Fuel Injection Timing Retard

Fuel Injection Timing Retard (FITR) reduces NOx emissions in reciprocating engines by delaying the injection of fuel in the engine from when the chamber is at its smallest, to a time when the compression chamber is expanding. The larger

volume in the compression chamber produces a lower peak flame temperature, thus reducing thermal NOx formation.

FITR reduces the fuel efficiency of engines leading to a potential increase in SO_2 emissions. The extent of FITR is also limited because excessive injection delay can cause the engine to misfire. Emission reductions can range between 20% to 30% depending on the degree of FITR implemented.

Lean Pre-mix

Lean pre-mixed combustion technology can be used for heaters, boilers, and turbines. The air and fuel are pre-mixed before introduction into the combustion zone. This results in a mixture with a very lean and uniform air-to-fuel ratio. The lean fuel-to-air ratio results in lowered average combustion temperatures, reducing the formation of thermal NOx. The homogeneous mixture prevents formation of localized fuel-rich pockets within the combustion zone, which further reduces peak temperatures and lowers thermal NOx formation. To stabilize the flame and to assure complete combustion with minimum carbon monoxide emissions, a pilot flame may be incorporated in the combustor or burner design.

Lean pre-mixed combustors are not an effective control technique at reduced load conditions, because as the fuel requirement is decreased, the air and fuel mixture becomes too lean for proper combustion. To avoid these conditions, manufacturers' lean pre-mixed combustors switch to a conventional combustion mode at reduced-load conditions, which result in higher NOx emissions.

Staged Fuel

Staged fuel burner technology for heaters, boilers, and turbines, consists of two combustion zones. In the primary zone, a portion of the fuel is introduced to the combustion chamber with a fraction of the fuel characterized as a fuel-lean burn. The excess combustion air acts as a heat sink and results in sub-stoichiometric combustion conditions. The

remainder of the fuel is injected in the secondary zone and combusted. The technology reduces thermal NOx.

Overfire Air

Off-stoichiometric combustion, for heaters and boilers, includes the following control technologies: using of secondary air, burners-out-of-service, and biased burner firing.

The Overfire Air (OFA) technique generally is not available for boilers with capacities less than 25 MMBtu/hr. OFA is applicable only to boilers with special burner design.

Regarding the NOx removal efficiency of OFA, performance test data reported by EPA for three small gas-fired boilers, ranging in size from 22 to 56 MMBtu/hr, showed that controlled levels in the range of 0.073 to 0.142 lb/MMBtu were achieved, with emission reductions of 13% to 73% reported. Data for a 22 MMBtu/hr boiler burning distillate oil showed that emissions were reduced from an uncontrolled level of 0.154 lb/MMBtu to a controlled level of 0.125 lb/MMBtu, an emission reduction of 19 percent.

Flue Gas Recirculation (FGR)

Flue gas or exhaust gas recirculation is a proven control strategy for boilers and heaters. The basic principal of flue gas recirculation (FGR) is to replace a portion of the incoming combustion air with exhaust gas. FGR reduces NOx formation by reducing available oxygen content and by acting as a heat sink to lower peak combustion temperatures. At full-load, this results in a richer burn with more exhaust gas to absorb the heat of combustion, resulting in a lower combustion temperature. NOx removal of up to 40% is achievable by using a maximum recirculation of 30% exhaust gas. FGR with LNB can reduce NOx emissions up to 71%. FGR systems are commercially available, and are therefore technically feasible.

Recently, a new class of ultra-low NOx burners has been developed, which use a combination of techniques. The

burners are designed to recirculate hot oxygen-depleted gases into the combustion zone, thereby maintaining optimum flame temperature, yet reducing NOx by excess air controls.

Staged Combustion Air (SCA)

Another low NOx technology for boilers and heaters is a rich/quench/lean staged combustion design. Air and fuel are injected directly in the combustion zone to mix and combust simultaneously. The off-stoichiometric or staged combustion air method separates the combustion process into two stages: primary and secondary combustion. Primary combustion is the first stage of combustion conducted in a fuel-rich combustion zone. Combustion is then completed at lower temperatures in a secondary, fuel-lean zone.

The fuel-rich first stage inhibits the formation of thermal NOx due to low oxygen levels. Second stage combustion temperatures are below NOx formation temperatures due to the injection of excess air. This design controls both thermal and fuel NOx. Low NOx burners (LNB) achieve reductions in NOx emissions by using multiple combustion stages with varying fuel-air ratios to reduce combustion temperatures and thermal NOx formation.

Good Combustion Practice

Good combustion practice is applicable for all combustion sources. This method requires operating *and* maintaining the equipment according to the manufacturer's recommendations, operator experience, and good arctic engineering practices to obtain maximum fuel efficiency and minimum emissions.

4.1.3 NOx Control for Wartsila Generator Five and Seventeen (MG-5, MG-17)

Cominco plans to operate seven 5000 kW Wartsila generator sets (MG-1 through MG-6, and MG-17). Two of these units (MG-5 and MG-17) are subject to BACT review. Wartsila engines MG-1 through MG-5 are existing 5000 kW units that

the Department permitted under PSD in 1988 with operational restrictions. Two of the five units were to operate in standby status. Cominco's application and permit did not identify the standby units. Therefore, the Department has interpreted that at least two of the five units must be in standby at any given time in order to comport with the 1988 permit decision.

In 1994, the Department issued a PSD permit to remove standby status from one of the existing units (unit MG-2). An operational cap of 109,660,000 kW-hr per year was imposed on the remaining four units--MG-1, MG-3, MG-4, and MG-5, which was equivalent to full-time operation of three units, with one unit on standby. Under the kW-hr operational cap, all four engines could operate simultaneously provided the annual kW-hr limit was not exceeded. Cominco also added a sixth 5000 kW Wartsila engine to operate full time as part of the 1994 permit.

Cominco is currently requesting the removal of the annual kW-hr operational restriction. Cominco has requested that MG-5 represent the standby unit for the purpose of BACT analysis. Therefore, MG-5 must undergo a BACT analysis as a modified source. Cominco is proposing to add a seventh 5000 kW Wartsila engine which, therefore, must undergo BACT analysis as a new emission source.

The control technologies Cominco evaluated as possible BACT technologies for MG-5 and MG-17 are Direct Water Injection (DWI)/Low NOx Modification, Fuel Injection Timing Retard (FITR), Low NOx Modification, Selective Catalytic Reduction (SCR), and Non-Selective Catalytic Reduction (NSCR). Because NSCR requires low oxygen content in the exhaust gas stream, it was the only control technology considered unavailable for diesel units due to technical constraints. Of the remaining technologies, Selective Catalytic Reduction with an estimated reduction of 90% is the most stringent. Top Down BACT analysis requires the consideration of the most stringent control technologies first.

If the most stringent control technology is considered BACT, then no analysis of less stringent controls is required.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is the most stringent control technology available for large diesel-fired generators. Top-Down BACT requires the Department to consider the most stringent technology before looking into less effective control technologies. The results of the Department's Technical and Economic analysis are presented below. The Department based the analysis on information provided by Cominco, SCR vendors, and SCR operators.

Technical Feasibility

SCR is a technically-feasible control technology for diesel internal combustion engines. The Department believes that, although SCR has not been implemented in Alaska, it is a technically-feasible technology for Alaska. SCR manufacturers, including Siemans are willing to offer SCR packages for diesel engines with warranties of up to 90% NOx reduction. For many years, the Department eliminated SCR as BACT, partly due to the safety concerns regarding the use and transportation of anhydrous ammonia to rural areas. However, recent innovations in SCR technology primarily alleviate the safety concerns regarding ammonia use.

Ammonia can now be generated safely from urea on demand. Without urea-based ammonia generation, Cominco would have to store large quantities of anhydrous aqueous ammonia on-site (185,000 gallons at the port, 7,125 gallons at the mine) due to the mine's remote location and short shipping season. With the storage of large quantities of ammonia, Cominco expressed concerns regarding the difficulty of evacuating mine personnel. However, with ammonia generated from urea, no ammonia storage is required at the port, and the mine-site ammonia requirement is reduced to one 2,000-gallon day tank and one 750-gallon mixing tank. Release of this small amount of aqueous ammonia at the

mine-site is unlikely to require evacuation of the entire facility. Urea-based ammonia generated on demand eliminates the ammonia safety concerns at the port and greatly reduces the risk at the mine-site.

Residual ammonia in exhaust does react with sulfuric and hydrochloric acid to produce ammonium salts. These salts can potentially be generated at explosive levels in the exhaust gas. However, current catalysts and sophisticated ammonia control systems effectively eliminate this risk. A more valid concern is ammonia slip where the SCR unit releases ammonia into the atmosphere due to the incomplete reaction of injected ammonia. Ammonia slip should be minimized using the vendor's proposed control systems. Cominco's vendor, Siemans, guarantees ammonia slip of less than 10 ppm at 15% O_2 in the exhaust gas. The OSHA Permissible Exposure Limit is 50 ppm (TWA), the ACGIH Threshold Limit Value is 25 ppm (TWA), and 35 ppm (STEL). The expected 10 ppm of ammonia slip will diffuse to significantly lower concentrations before the exhaust plume reaches the ground. Ammonia slip while not an immediate health concern, does introduce a new pollutant into the atmosphere. However, during the course of a year, operating two 5 MW engines full-time with SCR controls would result in approximately 5 tons of ammonia slip while removing over 1400 tons of NOx, when compared with uncontrolled NOx emission rates.

Economic Feasibility

With technical and safety concerns addressed, the primary issue is the economic viability of SCR at the mine's location. The Department asked for the economic analysis of SCR using both aqueous ammonia and urea. Cominco provided four cost scenarios for SCR. Each scenario included amortization over 10 years, 5 years, and 3 years. The Department generally considers an amortization period of 10 years as appropriate for a BACT analysis. Cominco provided the 5-year and 3-year amortization periods because they believe

natural gas reserves may be developed near the mine and the engines retrofitted for gas use within this time frame. However, without a firm commitment from Cominco to switch to natural gas, the Department selected an amortization period of 10 years. The scenarios provided by Cominco are discussed further below.

A crucial part of Cominco's economic analysis is consideration of the Waste Heat Recovery Unit (WHRU) that currently extracts waste heat from MG-5's exhaust gases. To install SCR, Cominco can either relocate the WHRU to another engine, or purchase a supplemental boiler to supply heat lost due to eliminating the WHRU. One of the scenarios provided by Cominco included both the costs of the supplemental boiler and the WHRU relocation as an estimate of lost future waste-heat recovery capacity. We believe that including both costs is inappropriate. Additional waste heat recovery needs are outside the scope of Cominco's production rate increase project as described in the current application.

Of the three remaining scenarios, two evaluate the costs for aqueous ammonia-based SCR in conjunction with relocating the WHRU and purchasing the supplemental boiler. The third scenario evaluates the cost of urea-based SCR in conjunction with purchasing the supplemental boiler. Cominco did not provide an economic evaluation of urea-based SCR with the WHRU relocated to another engine. For a prior project in 1993 (Cominco, 1993), Cominco provided an economic analysis of urea-based SCR but, this analysis does not take into account the WHRU relocation scenario. ADEC reused Cominco's current analysis to estimate the cost of urea-based SCR under the WHRU relocation scenario. The table below shows the cost per ton of pollutant removed for the three scenarios Cominco provided, the 1993 Cominco urea SCR cost estimate, and the ADEC estimation of urea-based SCR with the WHRU relocated.

Table 4.1.3 – 1. Selective Catalytic Reduction Cost Effectiveness

Origin	Reagent	Scenario	Cost/ton NOx Removed
Cominco 1998	aqueous ammonia	Supplemental Boiler	$5,643
Cominco 1999	aqueous ammonia	WHRU relocated	$3,743
Cominco 1999	urea	Supplemental Boiler	$4,072
Cominco 1993	urea	not addressed	$2,902
ADEC	urea	WHRU relocated	$2,279
ADEC	urea	WHRU relocated	$1,586

The $2,279/ton NOx removed cost is based directly on data Cominco provided, and uses the same assumptions. The $1,536/ton NOx removed cost is largely based on Cominco's data and assumptions. However, ADEC modified Cominco's methods to account for a more precise estimate of remote location costs and, per EPA guidance, a reduced annual cost of capital. Piping and electrical costs were lowered to reflect guidance from the EPA's *OAQPS Control Cost Manual*, EPA 450/3-90-066 (EPA 1990). ADEC lowered the cost of water pretreatment based on water use estimates provided by Cominco's SCR vendor and conversations with the water-treatment-system vendor. The $1,586/ton cost also reflects the higher cost of using more urea, since it appears that Cominco underestimated the mass of urea required for SCR. The details of ADEC's analysis are found in Appendix A.

The $2,902/ton NOx removed was included in Cominco's prior permit application of 1993, requesting the installation of the same make and model of engine. ADEC included the

1993 cost to provide a comparison with Cominco's current estimates and the Departments estimates.

ADEC considers all of the costs shown on the above table to be economically feasible. Additionally, the costs presented are within the range considered feasible by the U.S. Environmental Protection Agency (EPA) stated in their January 26, 1999 letter to ADEC (EPA 1999).

The technical reservations and safety issues concerning SCR are reduced by the use of modern catalysts and urea-based reagent. Of the available control technologies, SCR is the most stringent control, providing 90% reduction of NOx. The costs are well within what ADEC and EPA considers economically feasible.

BACT decision for Wartsila Generator Five (MG-5) and Seventeen (MG-17)

Cominco differs with ADEC that SCR is technically- and economically-feasible. Cominco maintains that SCR is unproven in an arctic environment, has safety issues associated with ammonia use, is too expensive and, therefore, should not be considered as BACT.

Because of this fundamental difference, Cominco has proposed an alternative that provides a NOx reduction similar to SCR and provides other advantages attractive to both Cominco and ADEC. Cominco proposed that the Wartsila Low NOx Modification package be BACT for the two engines under consideration. Cominco also proposes to install Low NOx controls on the three uncontrolled engines (MG-1, 3, 4) and installing Low NOx controls on the two engines with FITR as controls (MG-2 and MG-6). Wartsila estimates emission reductions of 30-35% from a conventionally configured unit. Wartsila estimates an additional 10% to 15% NOx reduction on the engines with FITR currently installed.

Installing Low NOx on all seven engines has several advantages over installing SCR on two engines. The capital and operating costs of Low NOx are lower than SCR. The table below compares the capital costs, annualized costs, and the cost per ton of NOx removed for Low NOx and SCR.

Table 4.1.3 – 2 Cost of Controls for a Single 5000 kW Wartsila

	Total Installed Capital Costs ($)	Total Annualized Costs ($/year)	Tons NOx Removed (tons)	Cost effectiveness ($/year)
Low NOx	$370,738	$89,754	237.4	$378
SCR	$3,629,257	$1,128,885	712	$1,586

Table 4.1.3 – 3 Large Diesel Engine NOx Controls Comparison

Operational Assumption	Control Technology	Tons NOx Removed (tons/yr)	Potential NOx Emissions after controls (tons/yr)
Operating Scenario A Seven engines continuous operation	Low NOx (seven engines)	1,662	3,878
	SCR (two engines)+ FITR (two engines)+ +three engines uncontrolled	1,741	3,799
Operating Scenario B 6 engines continuous operation, 1 engine on standby[1]	Low NOx (seven engines)	1,425	3,324
	SCR (two engines)+ FITR (two engines)+ +three engines uncontrolled	1,029[1]	3,720

[1] Potential emissions based on one SCR controlled engine on standby status.

The use of Low NOx controls also eliminates the logistical problems (such as shipping urea to the site) associated with operating SCR at the mine.

For full-time, 100% load operation, applying Low NOx controls to seven engines would result in 1,662 tons NOx removed per year. Similarly, for full time, 100% load operation, applying SCR to the two engines subject to BACT

would result in 1,741 tons NOx removed per year. Assuming full-time, 100% load operation, there is less than a 5% difference in NO_x removal between the SCR and Low NOx scenarios. The incremental cost of SCR controls to remove the additional 79 tons of NOx is $29,759 per ton of NOx removed. The high incremental cost for SCR compared with Cominco's proposal for Dry Low NOx controls on seven engines is exorbitant.

If all the generators were run full-time the installation of Low NOx on all seven generators would result in 79 tons per year more NOx emissions than the installation of SCR on the two generators that require BACT. In a practical sense, all seven engines will not be operating continuously or at full-load. A reasonable assumption is that under typical operating conditions one or more engines will not be running due to maintenance of standby-generation capacity. The higher operating cost of SCR in comparison with an uncontrolled generator provides an economic incentive for Cominco to reduce the operating time of the SCR unit. Following this reasoning, Cominco may choose one of the two units fitted with SCR as the standby unit in order to reduce operating costs. If an SCR controlled unit is in standby throughout the year, then the SCR scenario could emit up to 396 more tons of NOx per year than the Low NOx control scenario for all seven units. Installing Low NOx controls on all seven generators provides a greater consistency of control than installing SCR on just two engines. Therefore, this option could result in a greater emission reduction.

Cominco has proposed a proactive approach for a cost-effective NOx emission control strategy by installing Low NOx controls on five existing engines not subject to BACT review for this project. Because Cominco's proposal:

- achieves a similar maximum NOx reduction as the most stringent controls;
- can potentially result in a greater NOx reduction; and

- is logistically and economically less onerous to Cominco.

The Department finds Low NOx controls to be BACT on diesel generators MG-5 and MG-17. A vendor guaranteed emission rate of 11 grams per kilowatt hour is representative of the NOx reduction expected of the Low NOx controls selected as BACT. Condition XI(A) requires units MG-5 and MG-17 to meet an emission rate limit of 11 grams per kilowatt hour representative of BACT. Condition VI(B) requires source testing within 90 days upon start-up and every 5 years to demonstrate compliance with the BACT requirement. Condition XI(C) requires reporting the source test results. Condition VI(A) requires the installation of Low NOx controls on units MG-1, MG-2, MG-3, MG-4, and MG-6.

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONSTRUCTION PERMIT

Permit No. 9932-AC005 Date: Preliminary—May 4, 1999

The Department of Environmental Conservation, under the authority of AS 46.03, AS 46.14, 6 AAC 50, 18 AAC 15, and 18 AAC 50, issues this Air Quality Control Construction Permit to:

Owner and Operator: **Cominco Alaska, Incorporated**
P.O. Box 1230
Kotzebue, AK 99752

Permittee: **Cominco Alaska, Incorporated**

Facility: **Red Dog Mine**

Location: **145 km north of Kotzebue, Alaska**
UTM Coordinates Northing 7551 km, Easting 590 km
Zone 3

This permit authorizes the Permittee to modify the Red Dog Mine Facility:

- operate a new diesel-fired generator,
- remove operating restrictions on four diesel-fired generators,
- restore original operating restrictions on three other generator sets,
- add a diesel generator set,
- add a new incinerator and remove an old incinerator,
- add 12 new heaters,

- add an additional diesel storage tank,
- add a new crusher and baghouse,
- increase operating hours for the Assay Lab baghouse,
- increase fugitive emissions, and
- increase the holding capacity of the ore stockpile to support a production rate increase at the Red Dog mining facility.

This permit revises conditions of Air Quality Control Permit No. 9332-AA003 and expands the list of permitted equipment to include unlisted existing sources. This permit also authorizes the Permittee to operate the sources referenced above as provided by AS 46.14.120.

Jim Baumgartner,
Supervisor, Construction
Permits
Air Quality Maintenance Section

Date

TABLE OF CONTENTS

I. PERMIT CONTINUITY 1
II. STANDARD PERMIT CONDITIONS 1
III. RECORD KEEPING, REPORTING, AND TESTING CONDITIONS 2
IV. NOTIFICATION AND OPERATING CONDITIONS 4
V. 18 AAC 50.010: AMBIENT AIR QUALITY STANDARDS AND INCREMENTS 6
VI. OWNER REQUESTED LIMITS 8
VII. 18 AAC 50.040: FEDERAL STANDARDS ADOPTED BY REFERENCE 10
VIII. 18 AAC 50.050: INCINERATOR EMISSION STANDARDS 16
IX. 18 AAC 50.055: INDUSTRIAL PROCESSES AND FUEL-BURNING EQUIPMENT 16
X. 18 AAC 50.110: AIR POLLUTION PROHIBITED 17
XI. 18 AAC 50.315(E)(3)(A): (BACT) 18
XII. 18 AAC 50.315(E)(3)(B): ASSOCIATED GROWTH 19
EXHIBIT A 20
EXHIBIT B 24
EXHIBIT C 26
EXHIBIT D 27
EXHIBIT E 28
EXHIBIT F 29

I. Permit Continuity

A. Except as revised or rescinded herein, or as superseded by an Air Quality Permit issued under AS 46.14.170, the Permittee shall comply with terms and conditions of Air Quality Control Permit to Operate No. 9331-AA003, as revised December 4, 1996. If permit terms and conditions listed in this permit conflict with those of Permit No. 9331-AA003, the Permittee shall comply with terms and conditions listed herein.

B. Permit Condition 10 and kW-hour operating limits for units MG-1 and MG-3 through MG-5 listed in Exhibit A of Permit No. 9332-AA003 are rescinded the effective date of this permit action.

* * *

IV. Notification and Operating Conditions

A. The Permittee is authorized to install and operate emission sources at the Red Dog Mine facility as listed in Exhibit A.

B. Re-cam and rebuild each of Wartsila sources MG-1 and MG-3 through MG-5 with low emission retrofit parts before installation of source MG-17. Rebuild each of Wartsila sources MG-2 and MG-6 with low emission retrofit parts before installation of MG-17.

1. Adjust the fuel injection timing of each rebuilt unit to comply with emission limits set out in Condition VI(A)(4).

2. For each unit, provide a notice within 30 days after each unit has been rebuilt and adjusted to document the date rebuild was completed, initial engine start-up after rebuild, degree of fuel-injection timing retard adjustment, and attach a copy of the vendor service representative's trip report.

3. No less than once each calendar year, check and attach to the Facility Operating Report required by Condition 26 of Permit No. 9332-AA003, written verification of the fuel-injection timing retard setting for each engine. List the date of inspection, the service representative's name and credentials, and a copy of the representative's trip report.

* * *

VI. Owner Requested Limits

A. Limit:

1. Effective the issue date of this permit until each unit has been rebuilt using low emission retrofit parts, electric power production of each Wartsila Generator set MG-1 and M-3 through MG-5 should be no greater than 27,415,000 kW-hr per unit during any consecutive twelve-month period;

2. Carbon monoxide emissions from each Wartsila generation set, sources MG-1 through MG-6 and MG-17 to no greater than 8.0 lb/hour;

3. Particulate matter emissions from each Wartsila generation set, sources MG-1 through MG-6 and MG-17 to no greater than 2.6 lb/hour;

4. Oxides of nitrogen emissions from each Wartsila generation set sources MG-1 and MG-3 through MG-5 after engine re-cam and installation of low emission retrofit parts to no greater than 121.6 lb/hour and 11 gram per

kilowatt-hour, expressed as NO_2. Oxides of nitrogen emissions from sources MG-2 and MG-6 after installation of low emission retro-fit parts to no greater than 121.6 lb/hour and 11 gram per kilowatt-hour, expressed as NO_2;

* * *

XI. 18 AAC 50.315 (e) (3) (A): (BACT)

Install emission or operational controls as BACT for the following equipment:

A. Limits

1. Oxides of Nitrogen (NOx) BACT

a) Install and operate as BACT for the following fuel burning equipment at the Red Dog Mine/Mill Complex:

(1) Wartsila Generator Set Units MG-5 and MG-17 with low emission engine configuration;

* * *

b) Comply with the following NOx emission limits. Emissions from:

(1) MG-5 and MG-17 shall not exceed 11 gram/kw-hour and 121.3 lb/hour, expressed as NO_2.

* * *

B. Monitoring and Record keeping

1. NOx

a) For Units MG-5 and MG-17, maintain records of engine configuration changes and

fuel injection timing retard settings as set out in Condition IV(B).

* * *

c) For Units MG-5 and MG-17, conduct periodic NOx emission source tests as set out in Condition III(D) and VI(B)(2).

* * *

C. Reporting

1. NOx

a) Report rebuild and fuel injection timing requirements of MG-5 and MG-17 as set out in Condition IV(B)(2) and (3).

b) Report results of emission performance tests of Units MG-5, MG-17, and MH-1 through MH-3 as set out in Condition III(C).

* * *

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

JUL 29 1999

Reply To
Attn Of: OAQ-107

Mr. Tom Chapple
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801-1795

Re: Cominco Alaska Inc. PSD Permit Issuance

Dear Mr. Chapple:

I enjoyed our telephone conversation on Tuesday, July 27, 1999, regarding Cominco's Red Dog Mine PSD Permit. It is always good to hear a cooperative response when we have complex issues at hand. As promised during the call, I am including in this letter EPA's concerns about the proposed permit.

As we discussed, EPA has two major concerns with the proposed permit:

1. ADEC appears to agree that GM-5 and GM-17 are subject to PSD and must employ Best Available Control Technology (BACT). Although ADEC states in its analysis that selective catalytic reduction (SCR), the most stringent level of control, is economically and technologically feasible, ADEC did not propose to require SCR. Instead, ADEC concluded that installation of low NOx burners on all seven generators and fuel injection timing retard (FITR)

on some of the generators constituted BACT. EPA disagrees with this conclusion and believes that SCR is BACT for GM-5 and GM-17. As we discussed, once it is determined that an emission unit is subject to BACT, the PSD program does not allow the imposition of a limit that is less stringent than BACT even if equivalent emission reductions are obtained by imposing new controls on other emission units.

2. In its PSD analysis, ADEC failed to consider whether GM-1 and GM-3 through 5 are also subject to PSD and thus to BACT. Based on the existing information, EPA believes these emission units are subject to PSD because they are part of the overall project to increase the capacity of the facility through the removal of the existing restriction on operation of these units (the kilowatt per year restriction).

The National Park Service also raised these issues during the public comment period on the proposed permit.

I am pleased that ADEC is continuing to review information on past PSD permitting actions for the Cominco facility. I also appreciate your commitment to discuss your conclusions with my staff before issuing the permit, which you expect to occur in the next week to ten days. I am confident that we will be able to conclude this project by issuance of a solid PSD permit.

Once you have completed your reconsideration of the PSD issues for the diesel generators, please have your staff contact Doug Hardesty at EPA at (206) 553-6441 to discuss your intended response to EPA's concerns. Please also feel free to call me at (206) 553-2963 if I can be of any further assistance in this matter.

Sincerely,

/s/
Anita Frankel, Director
Office of Air Quality

cc: John Notar, NPS

State of Alaska
Department of Environmental Conservation
Division of Air & Water Quality
Air Quality Maintenance Section

MEMORANDUM

TO: Jim Baumgartner, Supervisor
Construction Permits

THRU:

FROM: Brian Renninger, Envir. Engin. Asst.
Air Permits Program

DATE: August 10, 1999

FILE: X00065 (Cominco PRI)

TELEPHONE NO: 465-5100; FAX: 465-5129

SUBJECT: Cominco NOx BACT

RE: Response to BACT section of Appendix A of Cominco's *Comments on Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005*, entitled *Presentation to Alaska Department of Environmental Conservation of Major Discretionary Air Quality Issues Pending Decision at Cominco's Red Dog Mine.*

The attached document is a response to the BACT section of Appendix A of Cominco's *Comments on Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005* received by the Department on June 7, 1999. Appendix A of Cominco's comments was originally provided to the Department on March 3, 1999 under the title *Presentation to Alaska Department of Environmental Conservation of Major Discretionary Air Quality Issues Pending Decision at Cominco's Red Dog Mine.*

The document is a point-by-point consideration of Cominco's comments. The majority of the document presents Cominco's comments verbatim, but the Department has paraphrased some of Cominco's comments to save space.

In summary, Cominco believes that a Top-Down analysis shows that the Low NOx retrofit package should be BACT for their Wartsilla 5 MW engines. Cominco's argument relies mainly on comparing the Low NOx retrofit package with Selective Catalytic Reduction.

AQM's response shows that while Cominco maintains that a Top-Down analysis is required, the analysis presented by Cominco is not a Top-Down analysis, does not present the lowest cost scenario, and appears to exaggerate the safety and environmental effects of ammonia. Cominco's analysis does not present information showing SCR to be environmentally, technically, and economically infeasible. Cominco has not completely analyzed the most effective available NOx control, as a Top-Down analysis would require. Cominco also has presented a BACT evaluation that appears to be a "Bottom-Up" analysis and in contradiction with current BACT determination processes.

In short, the information contained in the BACT section of Appendix A of Cominco's *Comments on Preliminary Technical Analysis Report for Air Quality Control Construction Permit No. 9932-AC005* is contrary to EPA guidance and accepted Top-Down BACT analysis procedures, and therefore should not be solely relied upon to determine BACT for the Red Dog Production Rate Increase Project.

* * *

SCAQMD determined a $17,000/ton NOx removed as the maximum cost per ton of pollutant removed. All the costs provided for SCR by Cominco are well within the California $17,000/ton limit.

The RBLC contains numerous BACT determinations for SCR on turbines whose costs-of-control fall within the same price range for SCR as Cominco's Wartsila. These include turbines in Pennsylvania, Virginia, New Jersey, California, and Oregon.

Finally, as stated earlier, the January letter from EPA's Raymond Nye states that costs under $10,000/ton should be considered economically feasible as BACT.

Of the examples cited above, none are exactly the same situation as Cominco's, but all have similar application to fuel burning equipment.

VII. *What is BACT for the PRI?*

VII. A. Cominco submits that SCR should be eliminated from consideration for the combination of reasons already noted:

1. *it imposes a major energy penalty in the form of burning a half-million additional gallons/year of diesel fuel;*

The scenario requiring this additional fuel consumption, as stated in response to items IV.B, IV.C, and IV.D, is not the scenario under consideration, nor is it the scenario presented in the preliminary TAR. Relocating the WHRU or installing a new WHRU eliminates this fuel expense and eliminates the additional pollution due to burning extra fuel.

2. *it provides minimal environmental benefits compared with Low NOx and poses a risk, albeit small, of serious injury and death to plant workers; and*

We agree with Cominco that the ammonia risks are small. The urea-based SCR system effectively minimizes the risk due to ammonia transport and handling. Since the majority of SCR operators use either aqueous or anhydrous ammonia in dense population areas, the risk to Cominco by using a urea-based SCR system is proportionately less than that incurred by operators of SCR using anhydrous or aqueous ammonia.

According to EPA guidance quoted in our response to V.A.1., environmental concerns should be used only as justification for requiring more stringent control technology; they should not be used to justify a less stringent technology.

Cominco has not shown that a 10-ppm ammonia stack concentration will cause harm to the environment. Conversely, ADEC staff have modeled ambient ammonia affects to be negligible.

3. *it* [sic] *costs are approximately 5 to 8½ times as much per ton of NOx removed as Low NOx controls.*

This comparison is inappropriate and spurious, and contrary with previously presented cost assessments we have prepared for Low NOx and SCR controls. Top-down BACT requires the most stringent feasible control to be used without comparison to less stringent controls. If it is economically feasible for an applicant to use a more effective control technology, then the more effective control technology should be used. The cost effectiveness of SCR is within what has been found feasible in comparable cases. According to data Cominco has provided to the Department, SCR appears within Cominco's means.

On balance, Cominco submits that the case for SCR cannot be supported. That explains why SCR has never been required for a similar source in similar circumstances in Alaska or elsewhere.

We disagree that the case for SCR cannot be supported. The information provided by Cominco in their application and supplements does support the case for SCR. Barring the upcoming installations at UAF, and Coeur Alaska's Kensington Gold Mine, we agree that SCR has never been applied in Alaska. We dispute that it has never been applied to similar emission sources elsewhere. As discussed in V.B.2, Cominco has provided information to the Department showing that SCR has been installed on similar diesel-fired engines throughout the world.

VII. B. *Figure 9 is a chart which compares, in quantitative terms, the various control options based on energy, environmental, and economic impacts, and uses a quantitative comparison to rank the options. Based on this evaluation, Low NOx is the preferred option.*

The analysis presented in Figure 9 is not a quantitative analysis, but a qualitative analysis and contains serious flaws with regard to BACT. First, operation per design is the base case. Because of operation per design is the base case, it is clearly a form of 'bottom up' BACT analysis which currently is not an accepted method for determining BACT. In addition, many of the ranking categories are redundant, arbitrary, or irrelevant. Moreover, the ranking scale of 1 to 3 appears arbitrary, improperly weighted, and is too small to illustrate the real differences between control technologies. The analysis presented in Figure 9 is clearly contrary to the current practice of BACT analysis and will certainly result in a greater, not less, arbitrary BACT decision than EPA's current 'top down', case-by-case analysis. If Cominco stands by Parts I and II of the BACT section of their presentation, then this analysis is clearly inappropriate if they believe a Top-Down analysis needs to be performed.

In summary, Cominco's arguments are not convincing that ADEC should dismiss SCR as BACT when conducting a Top Down assessment. Cominco has presented an inappropriate Bottom-Up analysis, does not present the lowest cost option of a given technology, and exaggerates the safety and environmental risks from SCR technology.

We maintain that SCR is technically, environmentally, and economically feasible. A top-down analysis should start with the most effective control technology. In this case, the most effective control is the combination of SCR in conjunction with direct water injection/Low NOx retrofit; Cominco has not discussed this possibility in their presentation, but has in their October 1998 supplement to their application. It is clear that SCR (the most effective individual technology) should

be considered technologically, environmentally, and economically feasible for the Red Dog power plant engines.

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Juneau, Alaska

FINAL
TECHNICAL ANALYSIS REPORT
For Air Quality Control Construction Permit No. 9932-AC005

Cominco Alaska, Inc.
Prevention of Significant Deterioration
Red Dog Mine Production Rate Increase

September 1, 1999

Prepared by:
Alaska Department of Environmental Conservation
Air Permits
410 Willoughby Avenue, Suite 105
Juneau, AK 99801-1795

With substantive information by:
Hoefler Consulting
1205 East International Airport Road, Suite 201
Anchorage, AK 99578

* * *

4.1.3 NOx Control for Wartsila Generator Five and Seventeen (MG-5, MG-17)

Cominco plans to operate seven 5000 kW Wartsila generator sets (MG-1 through MG-6, and MG-17) for the Production Rate Increase Project. Two of these units (MG-5 and MG-17) are subject to BACT review. Wartsila engines MG-1 through MG-5 are existing 5000 kW units that the Department permitted under PSD in 1988 with operational restrictions. Two of the five units were to operate in standby status. Cominco's application and permit did not identify the standby units. Therefore, the Department has interpreted that at least two of the five units must be in standby at any given time in order to comport with the 1988 permit decision.

In 1994, the Department issued a PSD permit to remove standby status from one of the existing units (unit MG-2). An operational cap of 109,660,000 kW-hr per year was imposed on the remaining four units--MG-1, MG-3, MG-4, and MG-5, which was equivalent to full-time operation of three units, with one unit on standby. Under the kW-hr operational cap, all four engines could operate simultaneously provided the annual kW-hr limit was not exceeded. Cominco also added a sixth 5000 kW Wartsila engine to operate full time as part of the 1994 permit.

Cominco is currently requesting the removal of the annual kW-hr operational restriction. Cominco has requested that MG-5 represent the standby unit for the purpose of BACT analysis. Therefore, MG-5 must undergo a BACT analysis as a modified source. Cominco is proposing to add a seventh 5000 kW Wartsila engine that, therefore, must undergo BACT analysis as a new emission source.

The control technologies Cominco evaluated as possible BACT technologies for MG-5 and MG-17 are Direct Water Injection (DWI)/Low NOx Modification, Fuel Injection Timing Retard (FITR), Low NOx Modification, Selective

Catalytic Reduction (SCR), and Non-Selective Catalytic Reduction (NSCR). Because NSCR requires low oxygen content in the exhaust gas stream, it was the only control technology considered unavailable for diesel units due to technical constraints. Of the remaining technologies, Selective Catalytic Reduction with an estimated reduction of 90% is the most stringent. Top Down BACT analysis requires the consideration of the most stringent control technologies first. If the most stringent control technology is considered BACT, then no analysis of less stringent controls is required.

Summary of Preliminary Decision and Public Comment

The applicant, Cominco, submitted an application for a construction permit to increase production at the Red Dog Mine. The production rate increase is subject to review under the prevention of significant deterioration (PSD) provisions of the state construction permit regulations, since it will cause significant emission increases in NOx. As a result, the applicant is required to show that BACT for NOx will be installed and used on each new or modified source.

As part of the production increase, the applicant proposed to increase electrical production at the Mine's power plant. In order to do this, the application called for the Department to remove an existing permit limitation that governed the operation of four diesel engines that make-up part of the power plant. This limitation currently restricts the combined operation of these four engines in a manner that would be equivalent to three engines operating full-load for the entire year. Through this permit action, the applicant desires to remove this limitation so the four engines can be operated full-load for the entire year.

In the matter of defining the modification, the applicant proposed that the emissions of three engines be limited according to the original 1988 permit, which allowed the operation of three engines full-load for the entire year. Also, the applicant proposed that the fourth engine, known as MG-5 and considered a standby engine in the 1988 permit,

be considered a modified source in this permit action and be subject to BACT for NOx. The Department concurred with this approach to defining the modification and the engine subject to BACT.

In March 1999, the program found that SCR was BACT on MG-5[1]. In response to this proposed preliminary determination, the applicant proposed an alternate emission reduction strategy to serve as BACT. The applicant also amended the application to include the installation of an additional new engine, known as MG-17. This new engine would also be subject to BACT.

The applicant's proposal consisted of two parts. In this first part, the applicant proposed to retrofit all of the existing, unmodified engines in the power plant with components that would reduce their NOx emissions. In the second part, MG-5 would be retrofitted with the same components and MG-17 would be supplied from the manufacturer with the NOx reducing components already installed. From the information presented, the retrofit appears to be equivalent to the manufacturer's most recent stock configuration of the 16V32 engine.

The Department proposed the alternate BACT in its preliminary decision, and argued that the aggregate emission reduction achieved at the power plant was nearly equivalent to the emission rate that could be achieved with SCR on only MG-5 and MG-17.

During the public comment period, the applicant, and the federal land manager objected to the alternate BACT proposal and the Department's judgement of it as meeting BACT. The applicant felt the Department did not use the appropriate standard of review and, if it had done so, would have rejected all control technologies except for the appli-

[1] March 3, 1999 memo from John M. Stone, ADEC, to Tom Chapple, ADEC.

cant's proposed BACT. The federal land manager also claimed the Department did not use the appropriate standard of review. However, they claimed the Department should have found that catalytic control was BACT.

* * *

NOx BACT Analysis for MG-5 and MG-17

The following presents the Department's final BACT review following the step-by-step top-down approach described previously.

Step 1 – Identify All Control Technologies

The sources under review are Wartsila 16V32 internal combustion, compression ignition, reciprocating engines. The engines burn diesel fuel and power 5,000 KW electric generators.

The applicant identified six control technologies for control of NOx that are applicable to the sources. The technologies are selective catalytic reduction, nonselective catalytic reduction, direct water injection, Low NOx components, Fuel Injection Timing Retard (FITR), Operation per design (no control).

In general, the Department concurs with the applicant's identification of available control technologies.

Step 2 – Eliminate the Technically Infeasible Options

The applicant eliminated from consideration non-selective catalytic reduction as being technically infeasible. In the preliminary decision, the Department concurred with the applicant that non-selective catalytic reduction is technically infeasible. This is because the oxygen content of the exhaust gas of the sources is too high.

The Department reviewed and concurred with this finding.

Step 3 – Rank the Remaining Control Technologies by Control Effectiveness

By reviewing the application and numerous submittals, one can develop a ranking of the remaining control options by control effectiveness. The Department, in its preliminary decision, did not provide a ranking of the control options by control effectiveness. For purposes of the final evaluation, the technologies were grouped into three control options: catalytic reduction, direct water injection, and the manufacturer's stock engine configuration as of a certain date.

A ranking for the MG-5 and MG-17 by control effectiveness, expressed as percent reduction in NOx from the base case and emission in tons per year after application of the control option, is shown below. The base case of the new engine, MG-17, is the 1999 stock engine. The base case of the modified engine, MG-5, is its current 1988 configuration.

Control Option	Emission Rate (TPY)		Per Cent Reduction	
	MG-17	MG-5	MG-17	MG-5
Catalytic Controls	53	90	90	90
Direct Water Injection	266	451	50	50
1999 Stock Engine	531	531	0	41
1988 Stock Engine	N/A	902	N/A	0

The applicant provided detailed discussion of the economic, environmental, and energy impacts of each control option in the application and numerous addenda.

Step 4 – Evaluate the Most Effective Controls and Document Results

In the application and comments on the Department's preliminary decision, the applicant argued that catalytic controls and direct water injection were not achievable at the Red Dog Mine for energy, environmental, and economic reasons. They concluded that an emission limit that could be achieved with a 1999 stock Wartsila engine should be BACT. To meet BACT for MG-5, they proposed to retrofit it to the 1999 configuration.

In its preliminary decision, the Department argued that an emission rate roughly equivalent to that which could be achieved with catalytic control was BACT. The Department indicated the emission limit could be met by retrofitting all of the engines in the power plant to the 1999 engine configuration. In this way, the Department tempered the stringency of BACT by crediting the applicant with emission reductions from sources that were not part of the permit action. Also, the Department did not reject catalytic controls or direct water injection as BACT due to energy, environmental, or economic considerations.

The applicant, EPA, and the Federal Land Manager criticized the Department's preliminary decision. These parties took exception to the Department's approach in tempering the stringency of BACT by crediting the applicant with emission reductions at existing, unmodified sources. The land manager and the applicant also criticized the Department for not following the top-down approach, in that the Department did not determine that catalytic controls or direct water injection were not achievable at the Red Dog Mine.

The collateral impact clause of the BACT definition allows permitting authorities to temper the stringency of BACT in cases where the energy, environmental, or economic impacts that are associated with the use of a control option at a specific facility are viewed by the review agency as sufficiently adverse as to render the use of that technology inappropriate for a given facility. In this case, the emission reductions achieved by the applicant's proposal to retrofit the

existing, unmodified engines into a 1999 configuration is not a consideration of the BACT review provided for by the applicable law or guidelines. Therefore, it cannot be used to temper the stringency of BACT.

* * *

Economic Impacts

In the preliminary decision, the Department recalculated and presented the costs associated with the catalytic control option. The Department did this because the applicant's cost estimates used inappropriate adjustments and appeared to double-count ~~ed~~ some costs. As presented, the applicant's costs appeared to be out of line with cost estimates available to the Department from other sources.

The applicant commented that the Department's economic analysis was flawed. The applicant ~~believed~~ asserted the Department did not appropriately account for all of the valid costs associated with the loss of heat recovery on MG-5.

The applicant looked at two options to replace the lost heat from the recovery unit on MG-5. One option was to install a supplemental boiler. The other was to install a heat recovery unit on an engine that is not currently outfitted with a heat recovery unit. Although the latter option is significantly cheaper, the applicant ~~does not~~indicated they do not prefer it because a future option to reclaim heat would be lost.

The applicant also asserted that the entire powerhouse and mill must be shut down in order to remove the heat recovery unit from MG-5 and install a new heat recovery unit on another engine. The applicant argued that the costs associated with the mill shutdown should be included in the catalytic control option.

To address the applicant's concerns, the Department adjusted the cost of catalytic controls for MG-5 by including the costs of removing the heat exchanger from MG-5 and installing a new heat exchanger on an engine that is not currently

equipped with waste heat recovery. The Department chose this option over the supplemental heat boiler because the Department anticipates the applicant would use the most cost-effective option if required to install catalytic controls. Although less costly, the applicant has asserted that this option would eliminate the potential for future waste heat recovery.

With respect to the mill shutdown costs, the Department was not persuaded by the evidence provided that the entire mill must be shut down in order to install a new heat recovery unit. Therefore, the costs associated with the mill shutdown were not taken into account in the catalytic control option for MG-5.

With the above adjustments, the Department's estimate for the costs of catalytic controls are presented in summary form below.

The capital cost to install catalytic controls on the new unit, MG-17, is estimated at $2.9 million, with an annual operating cost of $635,000. This translates to a cost-effectiveness of $2,100 per ton of NOx removed.

The capital cost to install catalytic controls on the modified unit, MG-5, is estimated at $3.6 million, with an annual operating cost of $760,000. This translates to a cost-effectiveness of $2,360 per ton of NOx removed. This cost includes the removal of the heat recovery unit and the installation of a new heat recovery unit on another engine.

As stated above, the applicant predicted the cost-effectiveness of SCR at approximately $5,600 per ton of NOx removed.[3] The applicant's cost estimate appears to be overstated.

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[3] Table A, Appendix A, February 1999 response to January 28, 1999 ADEC request for more information for Red Dog Mine, Hoefler Consulting Group.

Despite the differences over cost, the applicant believes the Department should reject catalytic controls due to economic considerations. In the applicant's words the "costs are very significant, affecting Cominco's cost of production and competitiveness in world markets."

The applicant cites several instances where the top-down approach allows permitting authorities to reject a control option for cost considerations.

The first is when an applicant demonstrates, to the satisfaction of the permitting agency, that the costs of pollutant removal for the control alternative are disproportionately high compared to the cost of control in recent permit determinations.

The second is when the cost-effectiveness of a control option is outside the range of costs being borne by similar sources under recent BACT determinations.

The third is when an applicant can demonstrate that the cost of the control option will cause adverse economic impacts to the facility.

The applicant provided a print-out from EPA's RACT/BACT/LAER Clearinghouse database (RBLC) to show that catalytic controls have not been imposed on any similar sources in recent permit determinations. Furthermore, they state that catalytic control has been rejected in the most recent determination in California.

Surveying the RBLC has value; since, in theory, permitting authorities are required to input BACT determinations into the RBLC. However, it would be imprudent to rely completely upon the RBLC, since permitting authorities are recalcitrant in their responsibility of inputting BACT data.

In order to address the applicant's concerns, the Department staff obtained as much information as possible about costs of BACT for similar sources throughout the country. Staff also

reviewed the information to see if there is a cost that is considered excessive for BACT.

Every BACT determination for a diesel-fired engine that is listed in the RBLC was reviewed by ADEC. The complete printout is available upon request.

There are no recent BACT determinations for diesel engines used as primary power generation in the RBLC. Moreover, there appear to be only 10 BACT determinations on diesel engines used for primary power generation since 1982. Of these, only one required catalytic controls. Cost data is available for two of the BACT determinations. The cost for both of these 1996 decisions was $432 per ton of NOx removed.

The Department also surveyed the RBLC for recent BACT determinations pertaining to metallic mineral mines. We found one. The facility contained a fuel oil-fired boiler that was required to install BACT at $5000 per ton of NOx removed.

~~We~~The Department reviewed the Department's recent BACT decisions to determine the cost of NOx BACT. costs range from $0 to $7,000 per ton of NOx removed. The four recent BACT determinations for diesel-electric generators used for primary power production range from $0 to $936 per ton of NOx removed. It should be noted that catalytic controls were rejected in two of the decisions because the engines are standby units.

The Department contacted the Air Programs in EPA's Regional Offices to see how much NOx BACT costs in other states, and if there is a cost that is considered excessive for BACT. In general, the Department found there does not appear to be a uniform cost policy that is used throughout the country.

Finally, the Department attempted, but was unable, to determine how much the newer units at electric utilities in the

United States pay for air pollution control per unit of power produced. This inquiry was based on the reasoning that the applicant's powerhouse is similar to an electric utility. If catalytic control costs for this permit action were substantially in excess of the amount that utilities are paying nationally for newer units, then the costs for these catalytic controls could be excessive.

Even without the national data, the Department looked at the cost of catalytic controls per unit of power produced for this permit action. If the Department assumes that both engines run at 80% of full capacity, then approximately 70 million kilowatts of electrical power will be produced each year. The combined annualized cost of catalytic controls for both units is approximately $2.1 million. This translates to a unit cost of 3¢ per kilowatt-hour.

If the applicant did not have a powerhouse, it would probably buy power from a rural Alaska utility. From a cursory review, it appears that the average cost of electricity in rural-Alaska is approximately 15¢ per kilowatt hour. Using this cost, catalytic controls would be equivalent to a 20% increase in the electric rate of the facility. In the Department's judgement, this is a disproportionate cost increase when viewed as an electric utility. Furthermore, the cost is significantly higher on a cost-per-ton removal basis in comparison to the $0 to $936/ton of recent BACT decision for similar installations.

Another perhaps better way to determine if the cost of BACT is excessive, is for the applicant to present detailed financial information showing its effect on the operation. However, the applicant did not present this information. Therefore, no judgment can be made as to the impact of a $2.1 million control cost on the operation, profitability, and competitiveness of the Red Dog Mine.

* * *

BACT decision for Wartsila Generator Five (MG-5) and Seventeen (MG-17)

The Department finds an emission rate achievable with Low NOx controls to be BACT on diesel generators MG-5 and MG-17. A vendor guaranteed emission rate of 121.3 lb/hour is representative of the NOx reduction expected of the Low NOx controls selected as BACT. Section 4, Condition 20 requires units MG-5 and MG-17 to meet an emission rate limit of 121.3 lb/hour representative of BACT. Condition 20 requires source testing within 180 days upon start-up for MG-17 and by March 2000 for MG-5 to demonstrate compliance with the BACT requirement. Condition Section 14, Condition 63 requires reporting the source test results.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

September 15, 1999

Reply To
Attn Of: OAQ-107

VIA FAX

Mr. Tom Chapple
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801-1795

Re: Cominco Alaska Proposed PSD Permit

Dear Mr. Chapple:

This letter is a follow-up to our recent discussions regarding the proposed prevention of significant deterioration (PSD) Permit Number 9932-AC005 for the Cominco Alaska, Inc. (Cominco) Red Dog Mine facility. I appreciate ADEC's willingness to discuss EPA's concerns. However, we have reviewed the September 3, 1999, final draft permit, and it still does not address our concerns. EPA believes the permit still does not meet the PSD requirements of the Clean Air Act. The major deficiencies are summarized below:

1. EPA remains concerned that the PSD analysis conducted by Cominco and accepted by ADEC is inadequate for several reasons. As outlined in my July 29, 1999, letter to you, EPA disagrees with ADEC's determination that the Best Achievable Control Technology (BACT) for Wartsila generators MG-5 and MG-17 is low NOx burners rather than selective catalytic reduction (SCR).

2. The September 3, 1999 draft permit does not require installation of BACT on Wartsila generators MG-1, MG-3, and MG-4, but only proposes to reinstate the annual emission cap on the total emissions from units MG-1, MG-3, and MG-4 (previously, this emissions cap applied to the total emissions from units MG-1 through MG-5). This limit is listed in the September 3, 1999 permit as:

> (1) 2259 tons nitrogen oxides (NOx) per year from units MG-1, MG-3, and MG-4, and
>
> (2) 750 ppm NOx corrected to 7% oxygen from each unit.

Note that while the 750-ppm limit applies upon issuance of the permit, the units are not required to be tested to determine compliance with the limit until 180 days after the engines are rebuilt. This may result in emissions in excess of the 2259-tpy limit prior to rebuilding and testing of the units. Therefore, compliance with the 750-ppm NOx emission limit should be determined upon issuance of the permit. Additionally, the permit conditions allow potential emissions from each generator that are greater than the past actual emissions from each of the generators and result in a significant emission rate increase. Accordingly, it appears that the Wartsila generators MG-1, MG-3 and MG-4 may be subject to PSD, including BACT.

* * *

In summary, the September 3, 1999, draft PSD permit as proposed by the State of Alaska does not meet the PSD requirements of the Clean Air Act or the Alaska SIP requirements relating to the construction or modification of new sources or the modification of existing sources.

EPA is also concerned that ADEC allowed Cominco to commence construction or modifications associated with Cominco's Production Rate Increase project at the Red Dog Mine facility prior to conducting a PSD analysis. Specifi-

cally, EPA believes that the April 2, 1996, ADEC authorization of Cominco's construction and installation of new equipment, including the new gyrator crusher, at the Red Dog Mine prior to Cominco's receipt of a PSD permit, is not in compliance with the Act or the Alaska SIP. In addition, based on a letter from ADEC to Cominco dated May 19, 1998, it appears that Cominco completed construction on the rock crusher described in its PSD permit application prior to the receipt of a PSD permit. It also appears that Cominco may have commenced construction or operation of other equipment or modifications as part of its Production Rate Increase project prior to receipt of a valid PSD permit. If so, these activities constitute a violation of Section 165(a)(1) of the Clean Air Act.

EPA urges ADEC to delay issuance of the PSD permit to Cominco and to conduct a thorough PSD analysis of all the modifications to the facility, including the diesel generators, to address the issues raised in this letter. EPA commits to work with ADEC to promptly address the technical and legal issues related to the Cominco Red Dog Mine PSD permit.

I look forward to speaking with you about these issues during the conference call scheduled for Wednesday September 15, 1999, at 2:00 PM Seattle time.

Sincerely,

/s/
Anita Frankel, Director
Office of Air Quality

cc: John Notar, NPS
John Stone, ADEC

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

SEP 28 1999

Reply To
Attn Of: OAQ-107

Mr. Tom Chapple
Alaska Department of Environmental Conservation
410 Willoughby Avenue; Suite 105
Juneau, Alaska 99801-1795

Re: EPA Review of Cominco Alaska Proposed PSD Permit

Dear Mr. Chapple:

I am sending you this letter as a followup to Chuck Findley's recent discussion with Michelle Brown regarding EPA's concerns with ADEC's proposed prevention of significant deterioration (PSD) Permit Number 9932-AC005 for the Cominco Alaska, Inc. (Cominco) Red Dog Mine facility. As promised, enclosed is the EPA staff review of ADEC's Technical Analysis Report.

Based on the conversation between Ms. Brown and Mr. Findley, I understand that ADEC will not start the 5-day consistency review process on the Cominco PSD permit until after, at the earliest, EPA has the opportunity to discuss the enclosed report with ADEC. Again, EPA urges ADEC to delay issuance of the PSD permit to Cominco until the permit complies with the Clean Air Act and is consistent with the issues raised in this staff review report and in EPA's prior communications with ADEC.

Doug Hardesty, of my staff, will call you on Wednesday to arrange a discussion of the issues raised in the enclosed review. If you have any questions, please feel free to contact Doug at (206) 553-6641.

Sincerely,

/s/
Anita Frankel, Director
Office of Air Quality

CC: J. Stone, ADEC

Enclosure

Review of Technical Analysis Report and PSD Permit for the Production Rate increase at Cominco Alaska, Incorporated's - Red Dog Mine

Region 10 of the Environmental Protection Agency has reviewed the final technical analysis report (TAR) for the draft air quality control construction permit (No. 9932-AAC005) to allow the implementation of the Production Rate Increase project at Cominco Alaska, Inc.'s, lead and zinc mine. The Region asserts that the Alaska Department of Environmental Conservation (ADEC) analysis of the project was inadequate in four main areas resulting in erroneous findings.

(1) The permit does not require installation and operation of the best available control technology for oxides of nitrogen on the 5 MW Wartsila engines (MG-5 and MG-17) used by the facility to produce electricity.

(2) Permit modifications to the NOx emission for units MG-1, MG-3 and MG-4 result in potential emission increases from each of the units without requiring BACT.

(3) Due to modeling analysis deficiencies, the ambient impact assessment indicates that the PM-10 increment (particulate matter with a mean aerodynamic diameter less than 10 microns) may be violated on the existing haul road; and

(4) The permit fails to adequately address other ambient air concerns including establishing a lawful and clear boundary delineating ambient air.

The Region concludes that the PSD permit should not be issued until the project meets the requirements of the Clean Air Act and addresses the concerns listed below.

Best Available Control Technology

Alaska regulations in 18AAC 50.310 (d) requires "a demonstration that the proposed limitation represents the best

available control technology for each air contaminant and for each new or modified source:" Therefore, the Best Available Control Technology (BACT) is required to be installed on each modification which undergoes a significant net emission increase.

BACT is conducted on a case-by-case basis using the top-down approach by ranking all control technologies in descending order of control effectiveness, then eliminating the technically infeasible options. After identifying and listing the available control options, the next step is to determine the energy, environmental and economic impacts of each option. The EPA has concerns primarily with the BACT analysis for the Wartsila engines.

Top-down Analysis

The ADEC did a commendable analysis in determining that selective catalytic reduction (SCR) for the internal combustion Wartsila units is technologically feasible and available. The ADEC states that a carefully designed SCR system can achieve NOx reduction efficiencies as high as 90% with an ammonia slip vendor guarantee of no greater than 10 parts per million (ppm). Region 10 has additional data which support these findings. For example, Wartsila has supplied the EPA with a list of 33 facilities which have installed SCR on more than 50 of their engines worldwide totaling approximately 470 MW of power generation. Installations include numerous facilities in cold climates such as Sweden and Norway as well as remote locations. Domestic installations of SCR on diesel-fired engines include Kauai Electric, Yale University and the Philadelphia Water Department. Conversations with catalyst vendors indicate that this technology has been available since the early 1990's. The DEC also indicated on page 34 of the TAR that no clear evidence has been found that the technology would be problematic in Alaska.

Furthermore, according to EPA's Alternative Control Techniques (ACT) document (EPA-453/R-93-032) for control of

"NOx Emissions from Stationary Reciprocating Internal Combustion Engines," July 1993, several more such installations exist:

"One base-metal catalyst vendor's diesel-fired SCR experience is presented in Table 5-11 and shows six U.S. installations with a total nine engines.... The available data show diesel-fired SCR applications using either zeolite or base-metal catalysts achieve NOx reduction efficiencies of 90+ percent, with ammonia slip levels of 5 to 30 ppmv. These installations include both constant- and variable-load applications." (Attached)

EPA agrees with ADEC's analysis that SCR is technically feasible at Cominco.

Environmental Impacts

Cominco maintained that the storage, use and emission of ammonia would result in unsafe conditions for the workers and adversely impact the environment. ADEC refuted these arguments. ADEC found no basis that ammonia emissions would affect the health-based standards or vegetative impacts. In addition, the accidental release and use of ammonia in catalytic control posed a small risk to workers and visitors. ADEC concluded that they believe ammonia use is safe and routine with proper controls, as demonstrated by an excellent safety record on similar units and turbines. Furthermore, ADEC concluded that NOx emissions reductions resulting from operation of the selective catalytic reduction system would improve workplace conditions. Based on the research of information conducted by ADEC, the state could not find any probable adverse environmental impacts at the Red Dog mine using an ammonia-based or urea-based catalytic control.

Energy Impacts

Cominco raised the issue that installation of SCR on MG-5 would result in having to remove a heat recovery unit from

the stack and install either heat recovery on an existing unit which does not currently have such a device or an entirely separate stand alone boiler for heat generation. These energy concerns were included by ADEC in calculating the cost effectiveness for SCR by accounting for the additional costs of removing the heat recovery from MG-5 and installing it elsewhere.

Economic Impacts

Cost-effectiveness is one of the economic impact analyses which may be considered when determining if a technology represents BACT for a specific application. However, a poor cost effectiveness in and of itself should not be construed as a measure of adverse economic impacts. Cost-effectiveness is generally described as dollars per ton of pollutants reduced. Average cost-effectiveness is determined by calculating the total annualized costs of control divided by annual emission reductions (the difference between the baseline emission rate and the controlled emission rate). To that end, the Region contends that an accurate cost-effectiveness for the SCR option is well within the range of reasonable costs for controlling NOx from the Wartsila engines. Early in the process, the Region informed ADEC that a reasonable cost-effectiveness of controlling NOx emissions from similar sources would be no greater than $10,000 per ton of NOx removed. The capital cost to install SCR on MG-5 and MG-17 was estimated to be $3.6 and $2.9 million, respectively with an annual operating cost of $760,000 and $635,000, respectively. The above noted costs result in a cost effectiveness of approximately $2,360 per ton of NOx removed for MG-5 and $2,100 for MG-17. Although the Region has reason to believe that those cost estimates are higher than would be expected, this analysis will rely on those estimates.

The reasoning behind the higher costs for MG-5 included costs associated with heat recovery. On page B.30 of the New Source Review Workshop Manual, the guidance states

that only direct energy costs associated with the use of the control device (to run the device) should be considered in the analysis. Heat recovery modifications would be an indirect cost and should not have been considered in the cost effectiveness calculation for MG-5. Regardless of the heat recovery costs, the cost-effectiveness is well within the range that the EPA considers reasonable and nothing in the TAR demonstrates to EPA that the cost-effectiveness is unreasonable.

Cost-effectiveness was not calculated in previous BACT determinations in which SCR was required on engines under the top-down BACT analysis because the companies did not argue that the technology should be rejected due to economic considerations. Once a control technology has been determined to be BACT on a particular type of source, i.e. an internal combustion engine, generally, that control technology should be considered economically feasible. Here, Cominco has not adequately demonstrated any site-specific factors to support their claim that the installation of this control technology is economically infeasible at the Red Dog Mine. Therefore, elimination of SCR as BACT based on cost-effectiveness grounds is not supported by the record and is clearly erroneous.

Furthermore, in order to justify economic infeasibility, the Region believes that the economic impact analysis conducted in the draft permit should have gone beyond a review of cost effectiveness to include an analysis of whether requiring Cominco to install and operate the more effective control strategies would have any adverse economic impacts upon Cominco specifically.

The cost effectiveness analysis in the Alternative Control Techniques document (EPA-453/R-93-032) is similar to the one performed by ADEC, finding a cost effectiveness of installing SCR resulting in a 90% NOx reduction on a 5-MW diesel-fired generator which operates approximately 8000

hours per year to be less than $1000 per ton of NOx removed (in 1993 dollars).

Water Injection

The Region is also concerned that the control cost analysis for direct water injection (DWI) was not performed properly by Cominco in its application. However, at this time, EPA does not believe that this deficiency is important since SCR has a higher control effectiveness than DWI. If EPA's determination that SCR is BACT is altered due to new information, EPA should require additional analysis of DWI.

Based on the analysis presented by ADEC, EPA finds no justification for Cominco's conclusion that the cost of SCR is unreasonable compared to the environmental and energy impacts associated with the use of this technology. EPA believes ADEC has made a convincing argument that SCR is technically feasible and cost effective and, therefore, should be BACT.

PSD Applicability to Units MG-1, MG-3 and MG-4

Cominco is requesting that the Wartsila generators (MG-1, MG-3, and MG-4) be placed under the operational cap that used to include MG-1, MG-3, MG-4, and MG-5. ADEC agreed and in removing MG-5 from the cap, required PSD review for only MG-5. Additionally, a seventh similar generator (MG-17) would be added. Thus, under the State's approach only MG-5 and MG-17 are being required by ADEC to install and operate the BACT. Cominco contends that MG-5 previously operated as a standby unit and that under the new configuration MG-1, MG-3, and MG-4 would not increase operation above the operational cap. In EPA's view, however, because the operational cap that used to apply to four units, would now apply to only three units under the cap. The cap is significantly higher than the past actual emissions from each generator. Thus, eliminating the operating limits results in a significant increase of potential emissions from MG-1, MG-3 and MG-4. Cominco should

provide records documenting the prior operation of MG-1, MG-3, and MG-4 so that their past actual operation and emissions can be determined for comparison to the future potential emissions that could occur under the restructured cap. Cominco must show that a cap that formerly covered four generators would not allow additional operation of the three generators that remain under the cap.

While EPA policy would normally not require an emissions unit to be subjected to BACT due to an increase in utilization of existing capacity resulting from modifications elsewhere at the facility, it does require that all emission increases associated with the modifications be counted toward PSD applicability and included in the air quality analyses. In this case, however, full PSD review (including BACT) should apply to MG-1, MG-3, and MG-4 since it is determined that these generators will experience an increase in potential emissions as the result of a restructuring (and potential relaxation) of the operational cap specific to them.

* * *

Conclusion

For all the reasons stated above, the Region concludes that the permit limits for the Wartsila engines for NOx emissions contained in the PSD permit are clearly erroneous and the BACT analysis for MG-1, MG-3, MG-4, MG-5 and MG-17 clearly indicates that selective catalytic reduction is the control technology of choice. MG-1, MG-3 and MG-4 are also subject to PSD and are subject to the BACT requirements. The BACT analyses are deficient in that they fail to reach conclusions that are supported by the PSD regulations, procedures or available information. Additional documentation is necessary to support the conclusion that PM-10 increment will not be violated on the road. The proposed permit does not clearly define the ambient air boundary, nor does it adequately preclude public access. As a result, Region 10 considers the proposed permit, if issued, to be in

violation of the Clean Air Act and its implementing regulations.

Cominco Alaska Incorporated
Red Dog Mine
P.O. Box 1230
Kotzebue, Alaska 99752
Tel. (907) 426-2170

October 8, 1999

Ms. Anita Frankel
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

RE: EPA Review of Cominco Alaska Incorporated (Cominco) PSD Permit

Dear Ms. Frankel:

Cominco has reviewed your letter of September 28, 1999, to Mr. Tom Chapple of the Alaska Department of Environmental Conservation (ADEC) regarding the ongoing air permitting effort for Cominco's Red Dog mine. Cominco offers the following general observations and comments. In addition, Cominco requests a meeting with EPA to discuss, in detail, each concern raised in your letter.

Since the initial permit application submission in June 1998, Cominco has been working very closely with ADEC to provide all of the information necessary for ADEC to thoroughly analyze the project and finalize the permit. Cominco undertook this expensive and time-consuming effort with the understanding that ADEC, through the EPA-approved State Implementation Plan (SIP), has the principal authority and discretion to prepare and issue Prevention of Significant Deterioration (PSD) permits in Alaska. Cominco was disheartened to learn that EPA has interjected itself and dis-

rupted the final stages of the permitting process, even though EPA did not provide comments during the public comment period and did not otherwise contact Cominco to obtain relevant and accurate information. Cominco questions the value of having developed a good working relationship with ADEC if EPA is not, in practice, willing to recognize the authority and discretion given to ADEC through the SIP approval process.

Best Available Control Technology (BACT)

Cominco believes that ADEC acted correctly in determining that the "Low NOx" modification is BACT for the Wartsila engines, based on a balanced weighing of environmental, energy, and economic considerations. Given EPA's assertion that SCR "has been available since the early 1990's," Cominco questions why EPA has targeted this permit action to dispute whether SCR represents BACT when all other ADEC-approved PSD applications in the 1990's for similar engines have rejected SCR as BACT without objection from EPA. Furthermore, EPA has recently approved Low NOx technology over SCR in several other regional and national decisions.

PSD Applicability to Units MG-1, MG-3, and MG-4

Cominco disagrees with EPA's PSD applicability analysis for units MG-1, MG-3, and MG-4. These units represent the three Wartsila engines that were permitted in 1988 to operate without restriction. These three engines underwent PSD review at that time. None of the changes made at the facility have effected ADEC's intent to allow the full-time operation of three Wartsila engines as permitted in 1988.

* * *

Cominco looks forward to discussing these issues in detail with EPA. I will continue to work with ADEC and EPA to finalize meeting arrangements.

Sincerely,

/s/
Charlotte L. MacCay
Senior Administrator, Environmental and Regulatory Affairs

cc: Michele Brown ADEC
Tom Chapple ADEC
John Key CAK
Jim Kulas CAK

Cominco Alaska Incorporated
Red Dog Mine
P.O. Box 1230
Kotzebue, Alaska 99752
Tel. (907) 426-2170

MEMORANDUM

October 29, 1999

To: Chuck Findley, EPA Region X

From: Charlotte MacCay, Cominco Alaska Incorporated

Re: EPA's Oversight of the ADEC PSD Permit for the Red Dog Mine

EPA requested that Cominco Alaska Incorporated submit an analysis of the specific economic impacts of requiring SCR at the Red Dog Operations with a projection of the cost per unit of production related to the costs of installing and operating SCR on the new Wartsila engine. Cominco Alaska strongly feels that BACT decisions should not, according to EPA's own guidelines, consider specific economic impacts or profitability. Accordingly, as well as for additional concerns related to confidentiality, Cominco Alaska will not be providing this analysis. However, as I mentioned at our recent meeting in Anchorage, I will submit the general economic status for Cominco Alaska.

The capital investment required to construct the Red Dog Operations remains a considerable debt to be recovered. At this time, we are roughly $400 million dollars in debt on this investment. Additionally, due to an unexpected drop in zinc prices around the time that the mine was commissioned Cominco Alaska lost over $150 million dollars in operating costs. During this same period of time, over $50 million

dollars of additional capital costs were invested in environmental improvements. While the last couple of years have proven to be profitable, Cominco Alaska's overall debt remains quite high.

Industrial development in rural Alaska is essential for one of the poorest regions of the state and nation. However, it is difficult to attract industrial development to this region due to the high investment required to overcome the lack of infrastructure and the lack of regional power. While industry in the rest of the nation enjoys available regional power, often provided through federal funding for rural electrification, we in rural Alaska do not have this basic provision. Here, development requires the unusual cost of constructing a power generation facility. The imposition of higher cost air quality controls for power generated by private industry over power generated by public utilities creates a cumulative and uncommon economic burden.

Cominco Alaska believes the State of Alaska has the specific understanding to make the BACT decision for the Red Dog Operations. We also believe the State has the authority to make this decision. We respectfully supply the attached memo regarding EPA's role in oversight of the approved PSD program.

Sincerely,

/s/
Charlotte L. MacCay
Senior Administrator, Environmental and Regulatory Affairs

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

NOV 10 1999

Reply To
Attn Of: OAQ-107

Michele Brown, Commissioner
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99810-1795

Dear Ms. Brown:

This letter is in response to our recent meeting with Cominco Alaska Incorporated (Cominco) regarding the Department of Environmental Conservation's (ADEC's) proposed draft Permit to Construct for Cominco's Red Dog mine site. I would first like to thank you and your staff for taking the time to meet on October 21, 1999, to discuss Cominco's Production Rate Increase Project. I believe the meeting was successful in resolving some and clarifying all of the issues concerning the proposed Prevention of Significant Deterioration (PSD) permit drafted by ADEC. I am writing you to summarize our current position on each issue in hopes that we can quickly find a solution agreeable to everyone. As we discussed in that meeting, we have been able to narrow the discussions to what I see as five distinct issues. Each of these issues is reviewed below including the understanding I have based on our last meeting.

ISSUE #1: What is U.S. Environmental Protection Agency's (EPA's) role in the PSD permitting process in Alaska?

During the meeting both ADEC and Cominco questioned EPA's role in ADEC-issued PSD permits, noting that EPA should not be involved unless the State's decision is erroneous or arbitrary. We disagree and strongly believe that EPA has a statutorily mandated role in the PSD permitting process in Alaska and in the rest of the nation. As explained below and communicated during our meeting, we believe ADEC's conclusions are not supported by the record and are therefore arbitrary and erroneous.

As outlined later in this letter, the Cominco permit as proposed does not comply with the PSD provisions of the Clean Air Act. Section 167 of the Act, 42 U.S.C. § 7477, provides EPA with the authority to act in precisely this kind of situation. Specifically, Section 167 provides that the Administrator shall take such measures, including issuance of an order, as necessary to prevent the construction or modification of a major emitting faciiity which does not conform to the requirements of Part C of the Act. Additionally, it is the Agency's policy that when a regional office determines that a permitting authority is likely to grant an improper permit, the appropriate response is to issue a section 167 order demanding that the permit not be issued. In this instance, because the proposed permit would allow Cominco to construct a major source without requiring BACT it is entirely appropriate for EPA to exercise its statutory authority. Contrary to Cominco's arguments on this point, there is no relevant case law supporting the proposition that EPA's involvement prior to the issuance of the PSD permit is inappropriate.

ISSUE #2: Is installing and operating selective catalytic reduction (SCR) on emission units MG-5 and MG-17 economically infeasible?

As discussed in more detail below, consideration of the collateral issues of energy, environmental or economic

impacts and other costs do not justify elimination of SCR as BACT in this case. We believe that ADEC's own analysis supports the determination that BACT is SCR, which renders ADEC's decision in the proposed permit erroneous.

As we discussed at the meeting, EPA does not believe that the cost effectiveness stated in the final Technical Analysis Report (final TAR) to the draft Permit indicates that the installation of SCR is economically infeasible. These costs are well within the range of costs EPA has seen permitting authorities nationwide accept as economically feasible for NOx control except where there are compelling site specific factors that indicate otherwise. Furthermore, in the preliminary Technical Analysis Report (preliminary TAR) ADEC indicated the costs for SCR were "well within" what ADEC considers economically feasible (preliminary TAR at p. 41). The ADEC's record does not support its change in its decision as stated in the final TAR that SCR is not economically feasible.

ADEC has expressed the concern that if SCR is required at Cominco, then SCR would automatically be required for new or modified engines at rural electric utilities. The concern is understandable given the essential nature of the service provided by the rural utilities in Alaska. We share your concern regarding the cost of electricity in rural Alaska and the impact of those costs on the rate payers. In accordance with EPA guidance and case law, BACT determinations are made based on individualized consideration of the specific facts and circumstances at the facility being permitted. Specifically, once the most effective technically available control technology is identified, the collateral issues of "energy, environmental, and economic impacts and other costs" (18 AAC 50.990(13)) are considered. Consideration of these collateral issues may operate as a 'safety valve' when circumstances unique to a specific facility justifies use of a less effective technology. The significant and unique local factors associated with rural electric utilities serving small Alaskan communities would be specifically analyzed

in any BACT determination involving the rural utility. We are currently reviewing such an analysis for Nome Joint Utility System (NJUS) and have provided you with a letter regarding that proposed permit and continue to support analyzing the energy, economic, and environmental impacts and other costs in determining BACT. As noted in the letter on NJUS, it's status as a non-profit, isolated public utility, influences how those "other costs" are considered in determining BACT.

ISSUE #3: Will the emissions from units MG-1, MG-3, MG-4, and MG-5 be allowed to increase?

As the permit is currently drafted we believe that the four "bubbled" generators are subject to PSD and BACT. During our meeting I suggested this dispute could be avoided if the potential to emit for the generators (MG-1, MG-3, MG-4 and MG-5) were not increased. In order to accomplish this, I suggested that Cominco consider installing Low-NOx on the engines listed above in order to keep emissions from all four engines less than the emission cap of 2,259 tons of NOx per year. Preliminary calculations conducted by Mr. Trbovich confirmed that Cominco could comply with this emissions cap on these four units if low NOx technology were installed on the units. I made this proposal in an effort to reduce the areas of disagreement between Cominco and EPA since this could eliminate further discussions of what constitutes BACT for unit MG-5 and avoid further debate on the need to install BACT on the remaining generating units. To that end, I propose that Cominco document that emissions from these 4 engines would remain under the emissions cap. Refurbishment of the generating units with the Low-NOx technologies may occur on a staggered basis as opposed to immediate installation upon the issuance of the PSD permit. If this approach is not implemented, then EPA's position remains that BACT is required for MG-1, MG-3, MG-4, MG-5 and MG-17.

* * *

Summary

I hope this furthers our Agency's mutual desire to resolve this matter in a timely and effective manner. I look forward to our continued collaboration.

Sincerely,

/s/
Chuck Findley
Deputy Regional Administrator

cc: Tom Chapple, ADEC
John Stone, ADEC

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Mr. Chuck Clark, Regional Administrator
United States Environmental Protection Agency Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Clark:

Thank you for meeting with Doug Horswill and me on November 23, 1999 to discuss air permitting issues at Com nco's Red Dog mine. We sincerely appreciate your willingness to help resolve the remaining differences that have developed between the state of Alaska and EPA over the state's Best Available Control Technology (BACT) determination. Alaska decided that a technology known as Low NOx is BACT for two of the diesel-fired reciprocating engines used to generate power at the mine, and that selective catalytic reduction (SCR) is not.

You asked us to furnish to you the economic information we alluded to during our meeting supporting the state's BACT decision, and Cominco's strong belief that SCR is not BACT for the diesel engines. This letter provides that information. Also because BACT analysis consider and weigh energy, environmental, and economic impacts and other costs, we have briefly summarized the information on those factors, in order to help you make a judgment on whether Alaska's decision is "clearly erroneous," as it must be for EPA to appeal it.

Economic Considerations.

1. What is EPA's Own Economic Standard for BACT Determinations? The standard EPA has applied in determining cost effectiveness in most cases is that spelled out by EPA's Appeals Board, namely that the cost is "either within or outside the range of costs being borne by similar sources under recent BACT determinations." *In Re Interpower of New York, Inc. PSD Appeals Nos. 92-8, 92-9*, (March 6, 1994) at page 23. EPA's draft New Source Review Workshop Manual (1990) (draft NSR Manual) states that in order to justify rejection of an alternative such as SCR:

> ". . . the applicant should demonstrate to the satisfaction of the permitting agency that costs of pollutant removal (e.g., dollars per total ton removed) for the control alternative are disproportionately high when compared to the cost of control for the pollutant in recent determinations."

Draft NSR Manual at 45.

2. Applying EPA's Cost-Effectiveness Standard. Based on our thorough review of EPA's RACT/BACT/LAER clearinghouse (see table of all recent RACT/BACT/LAER determinations for diesel-fired reciprocating engines attached as Attachment A), and Freedom of Information Act inquiries to states indicated, we find that **EPA has not required SCR as BACT on a diesel-fired reciprocating engine in any case, nor has any state**. These include several cases where the cost per ton of NOx reduction for SCR would have been less than they would be at Red Dog, and where the resulting public exposure to NOx was far greater than that projected at Red Dog.

a. Costs Borne by Similar Sources in Similar Circumstances in Recent Determinations. Diesel-fired reciprocating engines in the cities of Saint Paul (1996), Unalaska (1996), Ketchikan (1999, limited operation), and Nome (draft 1999), all in Alaska, and probably more similar than the other BACT determinations listed, have received recent Best

Available Control Technology determinations that considered and rejected SCR, and required less control than provided by the Low NOx technology being required by the state for Red Dog. Even under the far more stringent requirement applicable in nonattainment areas exceeding the health standard, namely, Lowest Achievable Emission Rate (LAER), the most recent determination in California did not require SCR (Tracy Material Recovery Plant, 1997). The only cases in which SCR has been required on such engines are not BACT determinations, but LAER determinations (Philadelphia NE Water Treatment Plant, 1992, ozone nonattainment area (NOx a precursor of ozone)) and (Ross Island Sand and Gravel, CA, 1996) where the health damage to which the NOx emissions contributed justified the disproportionate expense and other adverse environmental risks of SCR. In summary, there are no similar sources in similar circumstances in recent determinations that have been required to bear the disproportionate costs of SCR.

Even if one considers the costs borne by dissimilar sources in circumstances more favorable for operation of SCR than at Red Dog, SCR has been rejected as BACT. That is true of the Northstar PSD permit for combustion turbines on the North Slope (1999). It is also true for two 20 megawatt combustion turbine generators in Hawaii, where EPA upheld the state of Hawaii's rejection of SCR based on its determination that SCR was "not fully demonstrated for long-term operations on combustion turbine generators operating in simple cycle mode." *In Re: Maul Elec. Co.*, 1998 WL 666709, PSD Appeal No. 98-2 (EAB 1998).

There have been several other appeals, by EPA Regions and others, of determinations by states that SCR was not required. In every one of those cases, the state has been upheld. *In the Matter of Old Dominion Elec. Coop.*, 1992 WL 92372, PSD App. No. 91-39 (EAB 1992), *In the Matter of: Hawaiian Commercial and Sugar Co.*, 1992 WL 191948, PSD App. No. 92-1(EAB 1992), *In the Matter of: Mecklenburg Cogeneration Ltd. Partnership* 1990 EPA App. Lexis

42, PSD App. No. 90-7 (EAB 1990). In one of these cases that appealed a determination by the state of Virginia that SCR was not BACT, the Administrator of EPA stated that:

> Even though EPA Region III, for example, might well have arrived at a different determination had it been the permit issuer of record, the Petitioners have not persuaded me that the State's choice represents clear error, because the evidence "for" and "against" SCR was . . . in such close balance.

In the Matter of Old Dominion Electric Cooperative, 1992 WL 92372, PSD Appeal No. 91-39 (EAB, July 20, 1992).

In the only case we have been able to find where EPA disagreed with a state on what constituted BACT (EPA preferred water injection, the state found "operation by design" to be BACT), and issued a section 167 order, the court found that EPA did not have authority to issue a section 167 order collaterally attacking the permit, *U.S. v. Solar Turbines*, 732 F. Supp. 535 (M.D.Pa. 1989).

b. Rejection of SCR and Other Technologies Due to High Cost. Cominco has demonstrated that at Red Dog the cost per ton of NOx removed for SCR would be $5,640. This cost includes the real world cost of an arctic installation, supplemental boiler, and production lost due to shutdown during installation. Even without including these substantial costs, Alaska determined that SCR would cost $2100 per ton of NOx removed for new engine MG-17. This includes a total installed capital cost of SCR that is nearly 10 times that for low NOx and a total annualized cost of SCR more than 12 times the total annualized cost for Low NOx. For MG-17, therefore, SCR has an additional cost per year of over $1 million more than Low NOx. With an expected mine life of at least 40 more years, these costs are very significant, substantially affecting Cominco's cost of production. The costs borne by other sources, included those enumerated above, are a small fraction of these costs.

EPA has also upheld challenges to the rejection of SCR as BACT due to its high cost. For instance, in a 1997 BACT case, the EPA Environmental Appeals Board held that petitioners faded to demonstrate that Virginia's finding of $8,500 per ton of NOx removed was within the range of control costs borne by similar sources. *In re Commonwealth Chesapeake Corp.*, 1997 WL 94742, PSD Permit App. Nos. 96-2 through 96-5 (EAB 1997). Similarly, in a Reasonably Available Control Technology case (not BACT, but economically similar, requiring a control technology that is "reasonably available considering technological and economical feasibility"), the Washington Pollution Control Board found that costs for SCR between $1,186 and $1,837 per ton of NOx removed were not cost-effective and did not represent an "economically feasible" control technology, and that instead Low NOx technology costing approximately $112 to $233 per ton of NOx removed should be installed on a large coal-fired generating plant. *Bowers v. Southwest Air Pollution Control Authority*, 1999 WL 198964, Washington Pollution Control Board, Nos. 98-3 and 31, 1999). Likewise, EPA's EAB rejected costs between $4,000 and $6,000 per ton of SO2 removed as not cost-effective. *In Re: Inter-Power of New York, Inc.*, 1994 EPA App. Lexis 33, PSD App. Nos. 92-8 and 92-9 (EAB 1994).

Cominco submits that this information on economic costs establishes that (1) that no similar sources have borne the costs of SCR in recent determinations, and (2) that the cost of SCR is disproportionate to costs borne by similar sources in recent determinations. More importantly, this information demonstrates conclusively that Alaska's BACT determination of Low NOx as BACT at Red Dog is reasonable and not clear error that would justify EPA intervention.

Environmental Impacts of SCR and the Low NOx Modification.

The difference in total environmental impacts of NOx emissions predicted from Low NOx rather SCR as BACT on

two engines at Red Dog is the virtually insignificant amount of 1.6 micrograms per cubic meter ($\mu g/m^3$). For one engine, the impact would be approximately half that amount, and thus below EPA's de minimus impact levels. No public presence or residence exists within tens of miles of the Red Dog mine.

However, SCR requires the use of ammonia. A real risk, however small, exists for an ammonia release and worker exposure from the use of SCR at the Red Dog mine. Ammonia can cause serious injury or death. OSHA statistics show that the storage, use and handling of ammonia results in hundred of industrial accidents every year. At the Red Dog mine, that risk would be presented immediately adjacent to the residential quarters, under severe arctic conditions, in a remote area. In the case of *Blackhills Power and Light Co.*, 1993 WL 474540, the Wyoming Department of Environmental Quality rejected SCR in part for its adverse environmental risks, including "the danger to personal safety in delivering, storing and using ammonia (NH3) onsite, the creation of sulfuric acid mist, the problem in disposing of the catalyst of an SCR system, which is a hazardous material, excessive ammonia slip, [and] ammonia odor, ..." (Docket No. 2476-93,1993).

Energy Impacts.

For each unit on which SCR was installed, Cominco would be required to burn up to 531,730 gallons per year of additional diesel fuel to replace the waste heat unit loss caused by installing SCR rather than utilizing that waste heat. It would also be required to haul that amount of additional fuel from the Red Dog port by truck, creating additional emissions that would not be released if Low NOx were determined to be BACT.

Conclusion.

Taken together, we hope that you will agree that there are sufficient economic, environmental and energy bases in the

case of Red Dog's PRI PSD air permit for the state of Alaska to reject SCR as BACT, and to require Low NOx. In view of the information presented, we also hope you will concur that there is no further need for disagreement, controversy, or dispute resolution, and that Cominco may proceed on the long-delayed permit for Red Dog's much-needed and beneficial Production Rate Increase.

Please let us know if you have any questions or if we can provide further information to assist you in your determination.

Sincerely,

/s/
John Key

cc: Michele Brown, ADEC
Tom Chapple, ADEC
Chuck Findley, EPA Region 10
Doug Horswill, Cominco

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

DEC 10 1999

Reply To
Attn Of: OAQ-107

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Michele Brown
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801-1795

Re: Proposed PSD Permit for Cominco Alaska, Inc.

Dear Ms. Brown:

This letter is in follow-up to our recent conversations regarding the Alaska Department of Environmental Conservation's (ADEC's) proposed prevention of significant deterioration (PSD) permit for Cominco Alaska Incorporated (Cominco). As we have discussed, it is EPA's assessment that the permit as currently drafted does not comply with the PSD provisions of the Clean Air Act (Act) or the Alaska State Implementation Plan (SIP). In spite of our concerns, I want to reiterate statements made in previous communications to you. First, EPA is committed to working with ADEC to resolve the best available control technology (BACT) issues related to this permit. Second, while ADEC retains the permitting authority over the PSD program in the State of Alaska, EPA retains federal oversight authority as part of its responsibility to ensure national consistency. Thus, EPA will continue to review nationally significant issues and will review a State permitting decision on a case-

by-case basis when appropriate. Sections 113 and 167 of the Act provide EPA with the authority and responsibility to act in precisely this type of situation. Accordingly, the enclosed Finding and Order is issued under the authority of sections 113 and 167 of the Clean Air Act, 42 U.S.C. §§ 7413 and 7477.

It appears that there are two primary issues remaining in dispute: 1) emission limits for Wartsila generators MG-1, MG-3, and MG-4; and 2) the BACT determination for generators MG-5 and MG-17. I understand that ADEC and Cominco have agreed to permit conditions that would require low NOx controls on MG-1, MG-3, MG-4, and MG-5, and emission limits that reflect the previous "bubbled" limits. Under this approach, the permit would result in no increase in actual or allowable emissions from any of these engines and the installation of BACT would not be necessary for these four units. Assuming that the applicability or BACT determinations for MG-17 and other aspects of the production rate increase project will not be affected, this approach appears reasonable. Thus, if ADEC issues the PSD permit to Cominco with these provisions and others as discussed in the attached Order, the permit will comply with the Act and the Alaska SIP as it applies to these four generators, and Cominco may proceed with its production rate increase project in all aspects, except for new Wartsila generator MG-17.

The remaining issue is the BACT determination for MG-17. As we have stated previously, EPA believes that ADEC's own analysis supports the determination that BACT is selective catalytic reduction (SCR), and that ADEC's decision in the proposed permit therefore is both arbitrary and erroneous. The State's analysis as reflected in both the preliminary and final technical analysis reports indicates that SCR is technically feasible. Furthermore, contrary to ADEC's final conclusions, the State's record reflects that the cost-effectiveness and the collateral issues of energy, environmental, or economic impacts, and other costs, do not

justify failure to select SCR as BACT in this case. EPA does not believe that the cost-effectiveness analysis in the final technical analysis report demonstrates that the installation of SCR is economically infeasible. These costs are well within the range of costs EPA has seen permitting authorities nationwide accept as economically feasible for NOx control, except where there are compelling site-specific factors that indicate otherwise. Additionally, in the preliminary technical analysis report, p. 41, ADEC indicated the costs for SCR were "well within" what ADEC considers economically feasible. ADEC's record simply does not support its decision that BACT for MG-5 or MG-17 is low NOx controls rather than SCR.

In an effort to resolve the issue regarding BACT for MG-17, we are willing to continue discussions with ADEC and Cominco. In this vein I suggest that the three parties agree to utilize a third-party to facilitate non-binding negotiations. We are available to review and consider any additional information or analyses provided by ADEC or Cominco to support a determination that SCR is not BACT for modified or new Wartsila generators at the Red Dog mine facility. Utilizing a facilitator would not limit or restrict EPA's, ADEC's, or Cominco's authority, or defenses currently available to any of us, under existing law or regulation, but may provide a useful forum for continued negotiation on this issue. Furthermore, according to communications with Cominco, the new Wartsila generator MG-17 will not be on-site until next summer and NOx controls may be ordered and installed after shipping. Thus, Cominco's scheduling should not be significantly affected by the additional time needed to resolve this issue.

I recognize that it may take some time to resolve the disputed issues regarding this permit. Therefore, consistent with EPA's federal oversight role and to preserve EPA's authority during any additional negotiations regarding the Cominco permit, the enclosed Finding of Noncompliance and Order is issued.

Please call Douglas Hardesty, Office of Air Quality (206-553-6641) or me (206-553-0479), at your earliest convenience to discuss how you would like to proceed, and/or to begin scheduling and arrangements for a facilitator. Additionally, I encourage you to call either of us if you have questions regarding the enclosed Finding of Noncompliance and Order.

Sincerely,

/s/
Chuck Findley
Deputy Regional Administrator

Enclosure
cc: John Keys, Cominco

Bcc: Chuck Findley
Carol Holmes, OECA
Greg Foote, OGC
Karen Blanchard, OAQPS
Ray Nye, OAQ
John Keenan, OAQ
Rob Wilson, OEA
Julie Matthews, ORC
Source file

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONSTRUCTION PERMIT

Permit No. 9932-AC005 Issue Date: December 10, 1999

The Department of Environmental Conservation (the Department), under the authority of AS 46.03, AS 46.14, 6 AAC 50, 18 AAC 15, and 18 AAC 50, issues this Construction Permit to

The Permittee:

Cominco Alaska, Incorporated
P.O. Box 1230
Kotzebue, AK 99752

For the:

Red Dog Mine Facility
145 km northeast of Kotzebue, Alaska
UTM Coordinates Northing 7551 km, Easting 590 km
Zone 3

In accordance with AS 46.14.130(a), this permit allows the permittee to modify the facility in accordance with terms and conditions of this permit. This permit contains terms and conditions necessary to ensure that the permittee will build and operate the facility in accordance with 18 AAC 50.315(e).

/s/ December 10, 1999

Tom Chapple, Director Date
Division of Air & Water Quality

Table of Contents

Section 1.	General Permit Conditions	3
Section 2.	Ambient Air Quality Standards and Maximum Allowable Ambient Concentrations	5
Section 3.	Owner-Requested Limits	9
Section 4.	Best Available Control Technology (BACT) for Oxides of Nitrogen (NOx)	13
Section 5.	Best Available Control Technology (BACT) for Particulate Matter (PM) and Volatile Organic Compounds (VOC)	15
Section 6.	Federal New Source Performance Standards (NSPS)	18
Section 7.	National Emission Standards for Hazardous Air Pollutants (NESHAPS)	19
Section 8.	State Implementation Plan Emission Standards	20
Section 9.	General Source Testing and Monitoring Requirements	25
Section 10.	General Recordkeeping and Reporting Requirements	27
Section 11.	Sources Regulated by this Permit	29
Section 12.	Permit Application Documentation	34
Section 13.	Visible Emission Evaluation Procedures	35
Section 14.	Excess Emission Notification Form	39

Section 15.	Public Access Control Plan	41
Section 16.	40 CFR 60 - Subpart Kb-Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984	74
Section 17.	40 CR 60 - Subpart LL-Standards of Performance for Metallic Mineral Processing Plants	78
Section 18.	40 CFR 60 - Subpart OOO-Standards of Performance for Non-metallic Mineral Processing Plants	83
Section 19.	40 CFR 61 - Subpart A-General Provisions	94
Section 20.	40 CFR 61 - Subpart E-National Emission Standard for Mercury	111

* * *

14. Nitrogen Dioxide Requirements. The permittee shall comply with the following requirements for Sources MG- 1 through MG-6 and MG-17:

14.1 Oxides of nitrogen emissions, expressed as NO_2, shall not exceed 3,878 tons in any 12 consecutive month period.

14.2 For each calendar month, record the hours of operation of each source.

14.3 For each calendar month, calculate and record the emissions from each source and the emissions from all sources during the most recent 12 consecutive month period. Use the following equation and emission factors to calculate the monthly NOx emission rate, M, for each source. The Department, in its discretion, will adjust the emission factors based upon the results of source tests conducted according to the procedures specified in Section 9 of this permit. Upon receiving a written request or approval from the Department, the permittee shall use the adjusted emission factors.

M = Emission Factor x (hours of operation each month) x (1 ton/2000 lb)

Emission Factors:

Source MG-1 = 182.6 lbs/hour
Source MG-2 = 135.0 lbs/hour
Source MG-3 = 195.1 lbs/hour
Source MG-4 = 198.8 lbs/hour
Source MG-5 = 173.3 lbs/hour
Source MG-6 = 135.0 lbs/hour
Source MG-17 = 121.3 lbs/hour

14.4 Report the records required by this condition by submitting a copy of the records with the Facility Operating Report required by Condition 26 of Permit No. 9332-AA003.

* * *

18. Limits to Avoid PSD for Oxides of Nitrogen. To avoid PSD review for oxides of nitrogen, the permittee shall comply with the requirements of this section to limit the facility's potential to emit.

18.1 Limit the emissions of oxides of nitrogen from the Wartsila Generators, Sources MG-1, MG-3, MG-4, and MG-5 to no greater than 2259 tons in any 12 consecutive month period.

a. For each calendar month, record the hours of operation of each source.

b. For each calendar month, calculate and record the emissions from each source and the emissions from all sources during the most recent 12 consecutive month period. Use the following equation and emission factors to calculate the monthly NOx emission rate, M, for each source. The Department, in its discretion, will adjust the emission factors based upon the results of source tests conducted according the procedures specified in Section 9 of this permit. Upon receiving a written request or approval from the Department, the permittee shall use the adjusted emission factors.

M = Emission Factor x (hours of operation each month) x (1 ton/2000 lb)

Emission Factors:

Source MG-1 = 182.6 lbs/hour
Source MG-3 = 195.1 lbs/hour
Source MG-4 = 198.8 lbs/hour
Source MG-5 = 173.3 lb/hour

c. Report the records required this condition by submitting a copy of the records with the Facility Operating Report required by Condition 26 of Permit No. 9332-AA003.

* * *

Section 4. Best Available Control Technology (BACT) for Oxides of Nitrogen (NOx)

This section of the permit contains the requirements for NOx BACT imposed by this permit action. The BACT limits for the Wartsila Generators, MG-1, MG-3, and MG-4 originate from the BACT limits contained in the 1988 permit. The limits were removed in a 1994 permit action and are reimposed in this permit action. The effective date of the reimposed limits is delayed so that the permittee can undertake actions to comply with the limits.

20. The permittee shall comply with the following requirements:

20.1 For the Wartsila Generator, Source MG-17,

a. Limit NOx emissions to no greater than 121.3 lb/hour, expressed as NO_2, averaged over any three hours.

b. Make no irrevocable commitment for equipment or engineering design prior to May 1, 2000 that would preclude SCR as an emission control technology.

c. Do not commence permanent on-site construction of the MG-17 installation project before June 1, 2000. Within 30 days after construction commences, provide the De-

partment written notification of the date on-site construction commences.

d. Within 180 days after startup, conduct source tests to determine compliance with the NOx emission limit and report the results in accordance with the requirements set forth in Section 9 of this permit.

20.2 For the Wartsila Generators, Sources MG-1, MG-3, MG-4, and MG-5,

a. By December 31, 2000, limit NOx emissions of each source to no greater than 750 parts per million, corrected to 15 per cent oxygen in the exhaust, averaged over any three hours.

b. By December 31, 2000, conduct source tests on each source to determine compliance with the NOx emission limit in Condition 20.2a and report the results in accordance with the requirements set forth in Section 9 of this permit.

* * *

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Juneau, Alaska

FINAL
TECHNICAL ANALYSIS REPORT
For Air Quality Control Construction Permit No. 9932-AC005

Cominco Alaska, Inc.
Prevention of Significant Deterioration
Red Dog Mine Production Rate Increase

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TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS iii

1. EXECUTIVE SUMMARY 1

2. INTRODUCTION 5

2.1 PROJECT LOCATION 6
2.2 EMISSION SOURCES 6
2.3 PSD APPLICATION REQUIREMENTS 11

3. EMISSION STANDARDS 13

3.1 NEW SOURCE PERFORMANCE STANDARDS 13
3.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS 18
3.3 ALASKA EMISSION STANDARDS 19
SULFUR COMPOUNDS 21
3.4 ALASKA OPEN BURNING STANDARDS 22
3.5 PROHIBITIONS 23

4. BEST AVAILABLE CONTROL TECHNOLOGY 24

4.1 BACT DETERMINATION FOR NOx 29
4.1.1 Mechanisms of NOX Formation 31
4.1.2 NOx Control Methods 33
4.1.3 NOx Control for Wartsila Generator Five and Seventeen (MG-5, MG-17) 38
4.1.4 NOx control for Small Diesel Generators (MG-11 through MG-16) 50
4.1.5 NOx Control for Used Oil and Diesel Fired Heaters (MH-1 through MH-48) 51
4.1.6 NOx Control for Advanced Combustion Incinerator (MI-3) 54

4.2 CONTROL OF PARTICULATE MATTER (PM-10) 55
4.2.1 Mechanisms of PM-10 Formation 55
4.2.2 PM-10 Control Methods 57
4.2.3 PM Control for Diesel Generators (MG-5, MG-17, and MG-11 - MG-16) 57
4.2.4 PM Control for Diesel-Fired Heaters (MH-1 through MH-48) 59
4.2.5 PM Control for Incinerator MI-3 59
4.2.6 PM Control for the Assay Lab Bucking Room (MD-4) 60
4.2.7 PM Control for the Gyratory Crusher and Drop Box (MD-6 and MF-3) 60
4.2.8 PM Control for the Mine Roads (MF-5) 60
4.2.9 PM Control for Quarry Operations (MF-6) 61
4.2.10 PM Controls for Stockpiles and Exposed Areas (MF-7) 62
4.3 CONTROL OF CARBON MONOXIDE (CO) EMISSIONS 62
4.4 CONTROL OF VOLATILE ORGANIC COMPOUNDS (VOC) 63
4.4.1 VOC Control for Diesel-fired Generators (MG-5, MG-7, MG-11 -- MG-16) 63
4.5 CONTROL FOR OPEN BURNING (MF-8 AND 9) 64

5. AMBIENT AIR QUALITY IMPACT ANALYSIS 65

5.1 STANDARDS, INCREMENTS, AND AMBIENT ANALYSIS TOOLS 65
5.1.1 National Ambient Air Quality Standards 65

5.1.2 PSD Increments *66*
5.1.3 Ambient Analysis Tools *67*
5.2 METEOROLOGICAL DATA 68
5.3 AMBIENT AIR CONTAMINANT MONITORING 69
5.3.1 Pre-Construction Monitoring *69*
5.3.2 Refinement of Modeled NO_2 Concentrations *70*
5.4 DISPERSION MODELING 71
5.4.1 Model Selection *71*
5.4.2 Approach *72*
5.4.3 Final Results - AAAQS Analysis *77*
5.4.4 Final Results - PSD Increment Analysis *78*
5.5 CONCLUSIONS 79
6. AIR QUALITY-RELATED VALUES AND ADDITIONAL IMPACTS 81
6.1 PRIMARY IMPACTS 81
6.1.1 Visibility *81*
6.1.2 Soils and Vegetation *82*
6.1.4 Noise *86*
6.1.5 Odors *86*
6.2 SECONDARY IMPACTS 86
6.2.1 Induced Growth *87*
6.2.2 Construction Impacts *87*
6.2.3 Transportation Impacts *87*
7. PERMIT ADMINISTRATION 93
7.1 PERMIT CONTENT 93
7.2 OWNER REQUESTED OPERATION AND EMISSION LIMITS 94
7.3 PROJECT CONSISTENCY WITH ACMP 96
8. CONCLUSIONS 97

9. REFERENCES 99
APPENDIX A 104
APPENDIX B: BACT ANALYSIS 105
Appendix C: Emission Estimates and PSD Applicability 114
Appendix D: Coastal Project Questionnaire. 115

ABBREVIATIONS AND ACRONYMS

BACT	Best Available Control Technology
CEM	Continuous Emission Monitor
CFR	U.S. Code of Federal Regulations
CO	Carbon Monoxide
DEC	Alaska Department of Environmental Conservation
EGR	Exhaust Gas Re-circulation
EPA	U. S. Environmental Protection Agency
ESP	Electrostatic Precipitator
FITR	Fuel Injection Timing Retard
hp	Horsepower
hr	Hour
H_2S	Hydrogen Sulfide
ISO Conditions	288K, 60 pct relative humidity and 101.3 kilopascals pressure
KW	Kilowatts
LAER	Lowest Available Emission Rate
MMBtu	Million British thermal units
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NSCR	Non-Selective Catalytic Reduction
NSPS	New Source Performance Standards
NO	Nitric Oxide
NOx	Oxides of nitrogen
NO_2	Nitrogen Dioxide
OLM	Ozone Limiting Method
OSHA	Occupational Safety and Health Administration
PM	Particulate matter
PM-10	Particulate matter (10 micrometers or less in size)
ppmdv	Parts per million, dry volume basis

PSD	Prevention of Significant Deterioration
SCO	Selective Catalytic Oxidation
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction
SO_2	Sulfur Dioxide
TSP	Total suspended particulate (30 micrometers or less)
VOC	Volatile organic compounds
$\mu g/m^3$	Microgram per cubic meter

1. EXECUTIVE SUMMARY

The executive summary contains the following: an outline of the report; a brief summary of the facility; the proposed project; a history of pre-construction reviews conducted for the applicant's facility; a discussion regarding Prevention of Significant Deterioration (PSD) applicability; and a list of air quality control findings for the project.

Cominco Alaska, Inc. (Cominco), owns mineral rights and operates the Red Dog mine in northwest Alaska. The Red Dog mine is a surface zinc and lead ore mining operation located approximately 145 kilometers north of Kotzebue, Alaska. The facility is located on land owned by the NANA Regional Corporation and was developed jointly by Cominco and NANA. The Red Dog mine is situated in the DeLong Mountains of the western Brooks Range near the headwaters of the Wulik River. The topography of the area is mountainous with the nearby peaks reaching about 3,000 feet above sea level. Base elevation for the mine is approximately 1,000 feet above sea level.

On June 17, 1988, the Department issued an a Prevention of Significant Deterioration (PSD) permit to construct the Cominco Red Dog mine Project. Mining operations commenced in 1989. The projected mine life is about 50 years. The existing facility is classified under Standard Industrial Classification (SIC) code 1031 as Lead and Zinc Ores. The mine facilities include an open pit mine, rock crushing equipment, waste rock disposal sites, a tailings impoundment, a mill and concentrator, wastewater treatment facilities, and a concrete batch plant. Support facilities include power generation equipment, an airport, fuel handling and storage facilities, and personnel accommodations.

On July 27, 1994, the Department issued a PSD Permit to Operate No. 9332-AA003 to Cominco to install a sixth Wartsila diesel-electric generator to the Red Dog Project's power plant. The Red Dog mine currently operates under terms and conditions of Air Quality Control Permit to

Operate No. 9332-AA003, as amended December 4, 1996. Currently, ore and waste rock are removed at a rate of about 6,125,000 tons per year. The mill processes approximately 2,500,000 tons of ore annually, and produces 854,000 tons of concentrate.

On June 29, 1998, Cominco submitted an Air Quality Control Construction Permit application for the Production Rate Increase (PRI) project. The proposed production rate increase will raise Cominco's mill processing rate to 3,500,000 tons of ore per year, and will raise production of concentrate to 1,400,000 tons annually. On April 15, 1999, Cominco supplemented the PRI permit application to add another generator to the Red Dog Project power plant.

As part of the PRI project, the applicant proposes to remove air quality operating restrictions on power plant diesel generators, add a seventh 5 megawatt (MW) diesel generator, add a diesel generator set, add a new incinerator with restricted hours of operation, remove an existing incinerator, add 12 new heaters, add a diesel fuel storage tank, add a new ore crusher and baghouse, increase operating hours for the Assay Lab bucking room baghouse, increase fugitive emissions, and increase the holding capacity of the coarse ore stockpile building to support a production rate increase at the Red Dog mining facility. This application also seeks to correct errors in the previous permit and expands the list of permitted equipment to include small existing sources that were previously excluded. The applicant also requests approval for the use of sodium sulfide in the wastewater treatment plant for removal of cadmium metal from the water.

The proposed modification will result in an emission increase at the Red Dog mine of a sufficient magnitude to be classified as a modification. Therefore, the modification is subject to the PSD pre-construction review provisions under the State Air Quality Control Regulations. The Department has

completed its review of Cominco's PRI modification application and has made the following findings:

1. The application describes the facility as an existing mining and ore processing facility with diesel-fired electric generators and heaters having a combined potential to emit greater than 250 tons per year (tpy) of nitrogen oxides, carbon monoxide, and sulfur dioxide, as classified in 18 AAC 50.300(c).

2. The facility contains a source that must have an air contaminant control unit or system to comply with an emission standard set by 18 AAC 50.050 - 18 AAC 50.060, and has an industrial process with a total rated capacity or design throughput greater than five tons per hour as classified in 18 AAC 50.300(b)(1)(A).

3. The applicant proposes the following changes to sources at the Red Dog mine:

- permit 5 MW Wartsila generators (MG-1, 3, 4, and 5) to operate full time;
- add a seventh 5 MW Wartsila generator (MG-17) to operate full-time as a new source;
- add a new Advanced Combustion CA-500 incinerator with restricted hours of operation;
- remove the Kelly Hoskinson incinerator;
- add the new gyratory crusher;
- add a 1,200,000 gallon diesel-fuel storage tank;
- add a Cummins/Onan generator;
- add twelve new 100,000 Btu/hr diesel-fired heaters; and
- increase hours of operation of source MD-4.

4. Following the proposed modifications, the facility will contain one or more incinerators with a total combined rated capacity of 1,000 pounds per hour or more as classified in 18 AAC 50.300(b)(3).

5. The facility is classified as a "hazardous air contaminant major facility" because it has the potential to emit 25 tpy or more in aggregate of two or more hazardous air pollutants (HAPS). The facility emits 223 TPY of methanol and lessor quantities of other HAPs.

6. The proposal described in Finding 3 is a modification which may increase actual oxides of nitrogen (NOx) emissions by up to 1,100 tons per year; carbon monoxide (CO) emissions by 90 tons per year; particulate matter (PM) emissions by 35 tons per year; emissions of particulate matter smaller than 10 microns (PM_{10}) by 35 tons per year; volatile organic compound (VOC) emissions by 59 tons per year; and lead (Pb) by 0.46 tons per year. The proposal also results in a decrease in sulfur dioxide (SO_2) emissions by 37 tons per year due to using reduced sulfur fuel.

7. The new crusher, the mill building vents, truck unloading at the crusher, and the portable screen are subject to federal New Source Performance Standards (NSPS) 40 CFR 60, Subpart LL, as affected facilities at a metallic mineral processing facility. The units are subject to federal emission standards for particulate matter, incorporated by reference in Alaska Air Quality Control regulation 18 AAC 50.040(a)(2)(X).

8. The existing portable crusher and portable screen are affected facilities subject to federal New Source Performance Standards (NSPS) 40 CFR 60, Subpart OOO, at a nonmetallic mineral processing plant. The units are used to crush gravel for maintenance and construction aggregate. The units are subject to federal emission standards for particulate matter, incorporated by reference in Alaska Air Quality Control Regulation 18 AAC 50.040(a)(2)(FF).

9. The new diesel storage tank is subject to federal New Source Performance Standards (NSPS) 40 CFR 60, Subpart Kb, incorporated by reference in Alaska Air Quality Control regulation 18 AAC 50.040(a)(2)(M).

10. The existing and proposed incinerators are subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR 61, Subpart E, Emissions Standards for Mercury, incorporated by reference in Alaska Air Quality Control Regulation 18 AAC 50.040(b)(2)(A).

11. The proposed potential to emit NOx, SO_2, PM/PM_{10}, CO, VOC, and Pb will not cause or contribute to violations of the ambient air quality standards and PSD increments, subject to operational limits proposed by the applicant.

12. The emissions increases are greater than the PSD significant increase thresholds listed in 18 AAC 50.300(h)(3)(B)(ii), (iv), (v) and (vi); therefore, the Department will assess the best available control technology (BACT) for NOx, PM/PM_{10}, and VOC.

13. The applicant proposes the following controls as BACT: Low emission configuration with NOx fuel injection timing controls for MG-17. Good operational practices for PM and VOC emission controls from the diesel engines, heaters, and baghouse controls for industrial processes.

14. To protect SO_2 ambient standards and increments, the applicant proposes to burn distillate fuel oil with a maximum sulfur content of 0.45 percent (pct) by weight per purchase. The applicant proposes to burn distillate fuel oil with a maximum sulfur content of 0.45 pct by weight per purchase and 0.16 pct by weight annually for distillate fuel oil purchased after the permit issue date and delivered after January 1, 2000. The 0.16% by weight annual fuel sulfur average avoids classification under 18 AAC 50.300(h)(3)(B)(iii).

15. Emissions from the proposed sources will not impair visibility within Class I Areas and will not impair integral vistas identified in 18 AAC 50.015(c)(2) and 50.025(a).

16. The proposed emissions may have the potential to cause adverse vegetation impacts outside of the ambient air quality boundary, as indicated in Cominco's application.

17. Cominco has determined that the Red Dog Mine production rate increase is subject to the Alaska Coastal Management Program (ACMP). Therefore, the applicant submitted an Alaska Coastal Project Questionnaire (CPQ). The Department is reviewing the project for consistency under the ACMP. The ACMP reviewing agency must find the project consistent in order for the Department to issue a construction permit for the project.

Based on the review under 18 AAC 50.315(b)-(e), the Department proposes to issue the applicant Air Quality Control Construction Permit No. 9332-AC005 for the Red Dog mine.

2. INTRODUCTION

This Introduction Section describes the federal and State PSD Program components, project location, project description, facility emission inventory, and applicant's obligations under the PSD program.

The Federal Clean Air Act established the PSD program to manage air quality by evaluating the emission controls and potential ambient air quality impacts from proposed new or modified major stationary sources. The U.S. Environmental Protection Agency (EPA) has approved Alaska's PSD pre-construction review program for new or modified stationary sources to the State of Alaska. The Alaska Air Quality Control Regulations, 18 AAC 50, contain the PSD pre-construction review program. Entities desiring to build or modify a facility subject to the PSD pre-construction review program must submit an application to the Department prior

to constructing the facility or modification. The Department then reviews the emissions, proposed controls, and predicted ambient impacts, to determine whether the proposed facility/modification complies with the air quality standards and program requirements. Some of the emission sources associated with this permit have already been constructed prior to departmental review.

The facility is a "major" source as classified in 18 AAC 50.300(c)(1). The application describes a proposed modification classified as PSD-significant in 18 AAC 50.300(h)(3). Therefore, the Department requires this project to undergo pre-construction review under the PSD program and obtain an Air Quality Control Construction Permit. This review includes:

1. evaluating the potential to emit (PTE) from the facility and modification as restricted by emission or operational limitations;
2. determining the State and federal emission standards applicable to the project's emitting sources and the project's compliance with emission standards;
3. evaluating Best Available Control Technology (BACT) for new or modified emission units and establishing emission or operating limits, which represent BACT;
4. determining the attainment status of the air shed;
5. reviewing air pollution monitoring data regarding existing air quality and meteorological data in the vicinity of the project;
6. identifying the ambient air quality boundary for the facility;
7. assessing ambient air quality impacts of the project and associated activities relative to National and State Ambient Air Quality Standards (AAQS) and PSD increments; and

8. evaluating impacts of the project and associated activities on air quality-related values such as visibility, deposition effects on lands and waters, and effects on vegetation.

2.1 PROJECT LOCATION

The facility is located in the DeLong Mountains of the western Brooks Range, approximately 145 kilometers north of Kotzebue near the headwaters of the Wulik River. The mine location is at latitude 68°04' N and longitude 162°50' W. The topography of the area is mountainous with the nearby peaks reaching about 3,000 feet above sea level. Base elevation for the mine is approximately 1,000 feet above sea level. The Cominco facility is located in the Northern Alaska Intrastate Air Quality Region.

The Department has classified the air quality surrounding the facility as in attainment or unclassified with respect to the AAQS. The nearest area designated as "non-attainment" for any criteria pollutant is the Fairbanks urban area which is non-attainment for carbon monoxide (CO). Fairbanks is located approximately 430 miles east-southeast of the facility. Due to the great distances and topography, the facility will have negligible impacts on the non-attainment area.

Areas in attainment with the AAQS are categorized as Class I, Class II, and Class III for the purpose of air quality maintenance, depending on the level of industrial growth expected, and the need to protect the air quality of the area. The U.S. Environmental Protection Agency has established ambient air quality increments for each class, with Class I areas being most restrictive. The facility area is designated as a Class II area. The nearest Class I area is Denali National Park, located 420 miles southeast of the facility. Because the facility is over 10 kilometers away from a Class I area, the secondary definition of a significant emission increase does not apply as set out in 18 AAC 50.300(h)(3)(xviii).

* * *

4. BEST AVAILABLE CONTROL TECHNOLOGY

The Department's goal for the best available control technology (BACT) review is to evaluate available technologies, identify BACT for the project's emission sources, and establish emission or operational limits which represent BACT. This review is conducted in accordance with State and federal rules and guidelines. In this section, the Department evaluates the available control technologies for each emission source and selects BACT. In addition, the Department assesses the level of monitoring, record keeping, and reporting necessary to ensure the applicant applies BACT.

Under the State of Alaska's PSD Provisions of the Air Quality Control Regulations, an applicant subject to preconstruction review must show that BACT will be installed and used for each new or modified source. BACT is defined as an emission limit that represents the maximum reduction achievable for each regulated air contaminant subject to preconstruction review under the PSD provisions of the Clean Air Act (CAA). For this project, BACT evaluation is required for the following contaminants: oxides of nitrogen (NOx), particulate matter (PM-10), and volatile organic compounds (VOC).

Application of BACT must not result in emission of any pollutant which would exceed the emissions allowed by any applicable federal standard listed in 40 CFR, Part 60 NSPS, and 40 CFR 61 National Emission Standards for Hazardous Air Pollutants (NESHAPS).

On a case-by-case basis, the Department, taking into account energy, environmental, and economic impacts, determines emission limits for new sources or modifications through the application of production, process, or available control systems and techniques. The Department identifies available control technology and evaluates the most effective control measure available for a stationary source for each pollutant.

The Department may propose a balanced approach reducing all air contaminants in an optimized manner, rather than achieving the maximum degree of emissions reduction for a single air contaminant.

The Department evaluates economic feasibility of BACT by comparing the control cost of each available control technology. If the Department determines that technological or economic constraints of the control system for a particular pollutant would make the imposition of an emission standard infeasible, the Department may prescribe a design, equipment, work practice, operational standard, or combination, to satisfy the requirement for BACT. The Department will set forth the emission reduction achievable through implementation of such design, equipment, work practice, or operation.

As part of a complete application, the applicant must provide an adequate demonstration that the proposed emission control system represents BACT for the project. The applicant prepares an economic comparison of available technologies by summing the annualized capital and operational costs for a given technology, and dividing the cost sum by the air contaminant emission rate reduction expected for that technology. This results in an incremental cost for comparison with other technologies analyzed, in terms of cost per ton of air contaminant reduced. The lower the cost per ton, the less expensive it is to employ that technology. The Department determines the economic feasibility threshold that reflects the appropriate site-specific level of control for the pollutant and new sources.

The most commonly used procedure for determining BACT is well documented. The procedure is called the "top-down" approach. The "top-down" methodology is set forth in the U.S. EPA's proposed *New Source Review Rule Revisions* (EPA 1990). EPA has published numerous policy memorandums and guidance documents to assist applicants and permitting authorities in using the top-down approach. In addition, some court cases and many administrative appeal

decisions further amplify and clarify the top-down approach. The "top-down" approach is only guidance and not mandated by the Clean Air Act.

The top-down approach was used to reanalyze the proposed BACT contained in the Department's preliminary decision. The top-down process consists of five steps.

In step 1, the applicant identifies all available control options for the source and the pollutant under consideration. This includes technologies used throughout the world. An available control option is a practical air pollution control technology or technique to the emission unit and pollutant under evaluation.

To assist in identifying available controls, Cominco and the Department reviewed the available controls listed on EPA's RACT/BACT/LAER (RBLC) Clearinghouse bulletin board where permitting agencies nationwide have listed the BACT control technologies imposed within the past five years.

In step 2, the applicant evaluates the technical feasibility of the various control options in relation to the specific source under consideration. If the applicant can clearly document and demonstrate, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option, the option is eliminated from further consideration in this step.

In step 3, the remaining control options are listed in order of control effectiveness for the pollutant under review, with the most effective option at the top. In this step, the applicant also presents detailed information about the control efficiency, the expected emission rate, the expected emission reduction, and the cost, environmental, and energy impacts for each control option. An applicant proposing to use the most effective option is not required to provide the detailed information for the less effective options.

In step 4, the energy, environmental, and economic impacts are considered to arrive at the final level of control. The applicant is responsible for presenting an objective evaluation of both the beneficial and adverse energy, environmental, and economic impacts.

EPA's guidance describes the process for this step as follows: "If the applicant accepts the top alternative in the listing as BACT, the applicant proceeds to consider whether impacts of unregulated air pollutants or impacts on other media would justify selection of an alternative control option. If there are no outstanding issues regarding collateral environmental impacts, the analysis is ended and the results proposed as BACT. In the event that the top candidate is shown to be inappropriate, due to energy, environmental, or economic impacts, the rationale for this finding should be documented for the public record. Then the next most stringent in the listing becomes the new control candidate and is similarly evaluated. This process continues until the technology under consideration cannot be eliminated by any source-specific environmental, energy, or economic impacts which demonstrate that alternative to be inappropriate as BACT."

The process concludes in step 5, where the most effective control option not eliminated in Step 4 is proposed as BACT for the pollutant and source under review.

The applicant proposes to install and use Low NOx controls, which is not the most effective of the control options presented, and has put forth arguments to show that the more effective control options, catalytic reduction and water injection, are inappropriate as BACT due to environmental, energy, and economic impacts.

To assure a thorough and objective review of the applicant's arguments, the Department reviewed EPA memorandums, guidance, and administrative appeals to determine the appropriate standards for instances when an applicant attempts to demonstrate that more effective control technolo-

gies are not achievable due to adverse environmental, energy, and economic impacts.

When Congress created the BACT definition, they allowed the stringency of the BACT to be tempered by consideration of one or more collateral impacts – energy, environmental, or economic. This was intended to account for situations where the use of BACT in one area of the country was not applicable to another area of the country, due to differences in feedstock material, plant configuration, or other reasons.

EPA and the courts have interpreted the collateral impacts clause to serve as a safety valve, allowing a less stringent BACT whenever compelling and atypical energy, environmental, or economic circumstances specific to a facility constrain it from using of the most effective technology.

All BACT requirements, with limits, monitoring, record keeping, and reporting obligations are incorporated in Sections 4 and 5 of the permit. Table 4-1 below summarizes the BACT proposed by the Department.

Table 4-1 Department BACT Limits

Equipment	NOx	CO	PM-10	VOC
MG-17	121.3 lb/hr	N/A[1]	2.6 lb./hr, 20% opacity	
MG-11	0.031 lb/hp-hr	GOP[2]	20% opacity	
MG-12	0.031 lb/hp-hr	GOP		
MG-13	0.031 lb/hp-hr	GOP		
MC-1	N/A	N/A		
MG-14	0.031 lb/hp-hr	GOP		
MG-15	0.031 lb/hp-hr	GOP		
MG-16	0.031 lb/hp-hr	N/A		GOP
MH-1, MH-2, & MH-3	0.084 lb/MMBtu	GOP	20% opacity	
MH-4, & MH-5	GOP	GOP	20% opacity	
MH-6 through MH-36	GOP	GOP	20% opacity	
MH-37 through MH-48	GOP	N/A	20% opacity	
MI-3	GOP	N/A	0.086 gr/dscf 10% Visible Emissions	
MD-4	N/A	N/A	0.01gr/dscf, 20% Opacity	N/A

MD-6	N/A	N/A	0.01 gr/dscf, 7% Opacity	N/A
MF-3	N/A	N/A	10% Opacity	N/A
MT-1 & MT-2	N/A	N/A	N/A	Sub-part Kb[3]
MT-3	N/A	N/A	N/A	
MF-1	N/A	N/A	N/A	N/A
MF-5	N/A	N/A	Chemical Stabilization and Watering	N/A
MF-6	N/A	N/A	quarry-liquid application where practical, drilling liquid application	N/A
MF-7	N/A	N/A	Covering, revegetation, watering	N/A
MF-8 & 9	No Control	No Control	No Control	No Control
MF-10	N/A	N/A	N/A	N/A
MF-11	N/A	N/A	LL and OOO[3]	N/A
MF-12	N/A	N/A	OOO[3]	N/A

[1] N/A – Not Applicable

[2] GOP – Good Operation Practices

[3] Applicable portions of referenced NSPS Subparts

4.1 BACT DETERMINATION FOR NOx

This facility is currently permitted to emit greater than 250 tons per year of NOx, and is therefore classified as a PSD

Major facility under 18 AAC 50.300(c)(1). The proposed modification will increase allowable NOx emissions in excess of the 40 ton per year PSD applicability threshold specified in 18 AAC 50.300(h)(3)(b)(ii). Therefore, the Department will impose NOx BACT for the proposed NOx emission sources.

The Department evaluated several NOx control methods as BACT for the following sources: large diesel-fired engines, small diesel-fired engines, small heaters, and the modular waste incinerator. The specific options and evaluation results are summarized in Tables 4.1-1 to 4.1-4, and discussed in detail in this section.

Table 4.1-1 Summary of NOx BACT (Large Diesel-Fired IC Engines)

Available Controls	Technically Feasible	Economically Feasible	BACT
Selective Catalytic Reduction	Yes	No	No
Non-Selective Catalytic Reduction	No	N/A[1]	N/A
Direct Water Injection	Yes	No	No
Low NOx Modification	Yes	Yes	Yes
Fuel Injection Timing Retard	Yes	Yes	No
Operation per Design	Yes	Yes	No

[1] N/A - Not Applicable

Table 4.1-2 Summary of NOx BACT (Small Diesel-Fired IC Engines)

Available Controls	Technically Feasible	Economically Feasible	BACT
Selective Catalytic Reduction	No	N/A[1]	N/A
Non-Selective Catalytic Reduction	No	N/A	N/A
Direct Water Injection	No	N/A	N/A
Fuel Injection Timing Retard	Yes	No	No
Lean Burn Combustion	No	N/A	N/A
Turbocharger and After-cooler	Yes	Yes	No[2]
Operation per Design	Yes	Yes	Yes

[1] N/A – Not Applicable

[2] All of the engines are fitted with turbochargers as part of their design. Two of the engines, MG-14 and MG-15, are fitted with aftercoolers as part of their design. ADEC does not consider retrofitting the smaller engines with aftercoolers technically-feasible, due to their small size.

Table 4.1-3 Summary of NOx BACT (Small Heaters)

Available Controls	Technically Feasible	Economically Feasible	BACT
Low NOx Burner/Flue Gas Recircu-lation	Yes	No	No[1]
Staged Combustion Air	No	N/A[2]	N/A
Selective Catalytic Reduction	No	N/A	N/A
Operation Per Design	Yes	Yes	Yes[1]

[1] LNB/FGR is BACT for heaters MH-l, MH1-2 due to their larger size.

[2] N/A - Not Applicable

Table 4.1-4 Summary of NOx BACT (Incinerator MI-3)

Available Controls	Technically Feasible	Economically Feasible	BACT
Staged Air Combustion	Yes	Yes	Yes[2]
Selective Non-Catalytic Reduction	No	N/A[1]	N/A
Selective Catalytic Reduction	No	N/A	N/A
Operation Per Design	Yes	Yes	Yes[2]

[1] N/A – Not Applicable

[2] Staged air combustion is integral to the incinerators design.

4.1.1 Mechanisms of NOx Formation

Combustion is defined as the rapid chemical combination of oxygen with combustible elements of a fuel. Combustion produces heat that can be manipulated to generate power. Most fuels have three combustible elements: carbon, hydrogen, and sulfur, which unite with oxygen from atmospheric air to produce heat. Atmospheric air is a mixture that contains roughly 79% nitrogen and 21% oxygen by volume. Nitrogen present in the combustion process sometimes combines with oxygen, forming oxides of nitrogen.

There are several types of oxides of nitrogen formed during the combustion process, but only two types occur in significant quantities: nitric oxide--NO, and nitrogen dioxide--NO_2. In stationary source combustion, most of the NOx formed is nitric oxide (NO), which can oxidize in the atmosphere to form NO_2, a regulated air contaminant. At high temperatures, NO formation is favored almost exclusively

over NO_2 formation, and the rate of NO_2 dissociation to NO is favored by the mechanism:

$$NO_2 + O + \text{heat} \leftrightarrow NO + O_2$$

After the flue gas exits the stack, the entrained NO may be oxidized by atmospheric ozone to form NO_2. Other complex atmospheric reactions with NO and NO_2 can also occur.

There are three mechanisms for NOx formation during combustion of certain fossil fuels. These formation mechanisms are thermal, fuel-bound, and prompt NOx. A brief discussion of each mechanism follows.

Thermal NOx Formation

The predominant mechanism in combustion reactions is thermal fixation of the atmospheric nitrogen at elevated temperatures, usually greater than 2800°F, known as thermal NOx. Production of thermal NOx is an exponential function of the flame temperature, and a linear function of the time the hot gas mixture is at that flame temperature. This mechanism follows the Zeldovich reactions, with three predominant paths for NOx formation in combustion:

$$(1)\ N_2 + O \leftrightarrow NO + N$$

$$(2)\ N + O_2 \leftrightarrow NO + O$$

$$(3)\ N + OH \leftrightarrow NO + H$$

Note that reaction (1), which is highly temperature-dependent, provides the atomic nitrogen (N) necessary for reactions (2) and (3). Note further that the reverse reactions are not favored by the presence of molecular oxygen. Therefore, in the oxidizing environment that normally prevails downstream from the actual combustion zone due to the presence of excess combustion air, the NO that has been formed is essentially fixed.

Fuel-Bound NOx

Chemically-bound nitrogen in the fuel is known as fuel-bound nitrogen. The oxidation mechanism is dependent on fuel-bound nitrogen content, fuel properties, and the stoichiometric conditions present during combustion. The most significant factors attributing fuel-bound NOx formation are chemically fuel-bound nitrogen content, and the fuel-to-air ratio during the early stages of combustion when fuel-bound nitrogen is liberated from the fuel.

As the chemically-bound nitrogen in the fuel enters the flame zone, the fuel is burned into small reactive, nitrogenous organic molecules which react with oxygen to form NO. In a reduction environment where insufficient oxygen is present for complete combustion, such as the fuel-rich zone of combustion, the nitrogenous fuel fragments encounter and react with each other, and convert the fuel-bound nitrogen to molecular nitrogen (N_2).

Fuel-bound nitrogen can be a significant source of NOx emissions from fossil fuels such as residual oil and coal, but significantly less fuel-bound nitrogen is contained in natural gases. The Department typically uses the most conservative technique to estimate NOx emissions due to fuel-bound nitrogen--to assume that all nitrogen in the fuel is converted to NOx during combustion.

Prompt NOx

Prompt NOx is produced by the formation of an intermediary such as hydrogen cyanide (HCN), through the reaction of nitrogen radicals and hydrocarbons (HC),

$$NO + HC + H_2 \rightarrow HCN + H_2O$$

followed by the oxidation of the HCN to NO. The formation of prompt NOx has a weak temperature dependence and a short lifetime of several microseconds. It is only significant in very fuel-rich flames, which are inherently low NOx emitters.

4.1.2 NOx Control Methods

This section describes the control technologies that may be available to reduce NOx emissions from one or more of the source categories listed by the applicant. The Department's evaluation of the availability and effectiveness of these controls for each of the applicant's source categories is provided in Sections 4.1.3 through 4.1.5.

Selective Catalytic Reduction (SCR)

Selective Catalytic Reduction (SCR) is a potential emission control technology for turbines and other internal combustion sources. SCR systems use ammonia to selectively reduce NOx to N_2. This technology reduces both thermal and fuel-bound NO_2. SCR injects ammonia or urea into the exhaust before the exhaust enters a catalyst bed made with vanadium, titanium, or platinum. The reduction reaction occurs when the flue gas passes over the catalyst bed where the NO_x and ammonia combine to become nitrogen, oxygen, and water as follows:

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$$

$$2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O$$

The required catalyst bed temperature is dependent on the type of catalyst used, and must be maintained within a narrow temperature range for effectiveness. Manufacturers tailor their catalyst design for the temperature range expected. A metal oxide catalyst, such as vanadium or titanium is effective between approximately 600 °F and 750 °F. For a wider temperature range, zeolite catalysts have been effective in the 800 °F to 1200 °F temperature range.

Temperature dramatically affects NOx reduction because the catalyst exhibits optimum performance within a narrow temperature range. Below this optimum range, the catalyst activity is greatly reduced, allowing unreacted ammonia to "slip" through. This slip results in increased ammonia concentration in the exhaust gas that is discharged into the

atmosphere. Above the range, ammonia begins to be oxidized to form additional NOx. Further excessive temperatures may damage the catalyst.

In addition to tight operating temperature controls, the SCR process requires good control and continual adjustment of the ammonia injection rate to match the rate of NOx formation. An ammonia deficiency causes nitric oxide to react preferentially with the excess oxygen, while an ammonia surplus leads to additional ammonia slip.

Exposing a catalyst to sulfur-bearing fuels and ammonia forms ammonia salts. These salts foul the surface of the catalyst, rendering it useless and causing premature replacement.

Sulfur-tolerant SCR catalysts are available, but are composed of vanadium pentoxide, a hazardous substance. These catalysts are still susceptible to some ammonium sulfate fouling. The spent vanadium pentoxide catalyst would have to be shipped off-site for disposal. To address this concern, many catalyst vendors operate exchange programs where spent catalysts are exchanged for new catalysts at a reduced price. Exchange programs alleviate customer waste disposal concerns and allow the vendor to recycle the precious metals that make up many of the catalysts.

In summary, successful operation of an SCR system occurs if the catalyst is exposed to an exhaust stream that is not an oxidizing environment. The injection of a reducing agent, most commonly ammonia (NH_3), causes NO to preferentially react with the agent to form nitrogen and water, rather than reacting with the excess oxygen. SCR requires a narrow temperature range to achieve optimum catalytic performance. SCR may be used in conjunction with reductions from steam or water injection, or combustion modifications.

Carefully designed SCR systems achieve NOx reduction efficiencies as high as 90%, with ammonia slip vendor guarantees of no greater than 10 ppm available. Conservative reductions are 80% control efficiency. The Department has no clear evidence that the technology would be problematic in Alaska.

Non-Selective Catalytic Reduction (NSCR)

Non-selective Catalytic Reduction (NSCR), sometimes called a three-way catalyst, reduces NOx emissions 80% to 90% at a temperature between 800 and 1200 degrees F. NSCR systems use a mixture of platinum and rhodium catalyst, and carbon monoxide and hydrocarbons (CH_4) as reducing agents contained in the flue gas, forming N_2, H_2O and carbon dioxide. The chemical reaction process is not fully understood, but can be represented in the following basic formulas:

$$CH_4 + 4NO_2 \rightarrow CO_2 + 4NO + 2H_2O$$

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

$$CH_4 + 4NO_2 \rightarrow CO_2 + 2N_2 + 2H_2O$$

$$2CO + 2NO \rightarrow 2CO_2 + N_2$$

$$2H_2 + 2NO \rightarrow 2H_2O + N_2$$

NSCR is only effective in a fuel-rich, preferably gas-fired, non-variable load combustion. The air-to-fuel ratio must be at or close to stoichiometric to provide adequate concentration of reducing agents in the exhaust gas. Stoichiometric combustion produces exhaust gas nearly depleted of oxygen (less than four percent oxygen). The inability to control air-to-fuel ratio for varying loads limits NSCR application. NSCR is best known for its application in reducing NO_x from automobile exhaust. NSCR uses no reactant for the control of NOx.

Selective Non-Catalytic Reduction (SNCR)

Selective non-catalytic reduction (SNCR) is a thermal denitrification process that also involves the injection of ammonia or urea into the exhaust gases. The ammonia or urea reduces NOx to N_2 within a narrow temperature range of

1600 to 2000°F without a catalyst. At these temperatures, 80 to 90% NOx emission reduction can be achieved. Since the optimum reaction temperature is very high, the applicability of SNCR is primarily restricted to large industrial boilers.

As with SCR, SNCR requires transportation, handling, and storage of ammonia, a hazardous substance. There is a potential of ammonia slip in the exhaust gas, increasing ammonia levels in the ambient air. The other technical problem for most applications is the physical ammonia or urea injection location. For equipment operating at various loads, the proper injection temperature "window" physically moves within the combustion zone and the exhaust ductwork, requiring multiple injection locations.

Direct Water Injection/Low NOx Modification

Direct Water Injection lowers the peak flame temperature by providing a heat sink that absorbs some of the heat of the reaction, thereby reducing peak flame temperature and the resultant rate of NOx formation. The water injected into the engine is required to be extremely pure or the engine will require significant amounts of maintenance and repair. The manufacturer of Cominco's large diesel-fired engines, usually installs Direct Water Injection on engines with Low NOx modification packages. The Low NOx modification package is described below. Cominco has verified that a reverse osmosis water treatment and injection system would be necessary for this technology to be considered. A NOx reduction of 40% to 60% may be expected with this combined technology. Wartsila expects NOx emissions of approximately 6 grams per KW - hour with DWI controls installed on the 5000 kW generators. The manufacturer expects no additional fuel consumption when retrofitting the 5000 kW generators with both DWI and Low NOx Modification. If only DWI was retrofit, a 3% increase in fuel consumption is anticipated.

DRY CONTROLS

Dry controls incorporate an efficient combustion chamber design, staged combustion, and/or use of a lean fuel-to-air ratio. The use of lean fuel-to-air ratio results in lowered average combustion temperatures, reducing the formation of thermal NOx. Thermal NOx formation tends to be maximum at the high temperatures associated with stoichiometric conditions. Combustion chamber design changes may also reduce peak temperatures, thus limiting thermal NOx formation. The design techniques for this "dry low NOx" (DLN) combustion technology include staged combustion and/or use of a lean pre-mix combustion configuration. Specific examples are provided below.

Low NOx Modification

For the main generators, Wartsila has developed a retrofit package called a Low NOx Modification. This modification is based on a higher combustion air temperature at initiation of the injection cycle, which drastically reduces the ignition delay. The retrofit also retards the fuel injection start and has a shorter injection period that makes combustion take place at the optimal point with respect to efficiency. It improves fuel atomization, and modifies combustion space for improved mixing of air and fuel. The design requires replacement of the piston crowns, piston ring set, fuel injection valve, cylinder head, cylinder liner, and antipolishing ring. The Low NOx modification is expected to reduce NOx emissions approximately 30% from the Wartsila engines. The low NOx modification incorporates fuel injection timing retard as described below.

Fuel Injection Timing Retard

Fuel Injection Timing Retard (FITR) reduces NOx emissions in reciprocating engines by delaying the injection of fuel in the engine from when the chamber is at its smallest, to a time when the compression chamber is expanding. The larger

volume in the compression chamber produces a lower peak flame temperature, thus reducing thermal NOx formation.

FITR reduces the fuel efficiency of engines leading to a potential increase in SO_2 emissions. The extent of FITR is also limited because excessive injection delay can cause the engine to misfire. Emission reductions can range between 20% to 30% depending on the degree of FITR implemented.

Lean Pre-mix

Lean pre-mixed combustion technology can be used for heaters, boilers, and turbines. The air and fuel are pre-mixed before introduction into the combustion zone. This results in a mixture with a very lean and uniform air-to-fuel ratio. The lean fuel-to-air ratio results in lowered average combustion temperatures, reducing the formation of thermal NOx. The homogeneous mixture prevents formation of localized fuel-rich pockets within the combustion zone, which further reduces peak temperatures and lowers thermal NOx formation. To stabilize the flame and to assure complete combustion with minimum carbon monoxide emissions, a pilot flame may be incorporated in the combustor or burner design.

Lean pre-mixed combustors are not an effective control technique at reduced load conditions, because as the fuel requirement is decreased, the air and fuel mixture becomes too lean for proper combustion. To avoid these conditions, manufacturers' lean pre-mixed combustors switch to a conventional combustion mode at reduced-load conditions, which result in higher NOx emissions.

Staged Fuel

Staged fuel burner technology for heaters, boilers, and turbines, consists of two combustion zones. In the primary zone, a portion of the fuel is introduced to the combustion chamber with a fraction of the fuel characterized as a fuel-lean burn. The excess combustion air acts as a heat sink and results in sub-stoichiometric combustion conditions. The

remainder of the fuel is injected in the secondary zone and combusted. The technology reduces thermal NOx.

Overfire Air

Off-stoichiometric combustion, for heaters and boilers, includes the following control technologies: using of secondary air, burners-out-of-service, and biased burner firing.

The Overfire Air (OFA) technique generally is not available for boilers with capacities less than 25 MMBtu/hr. OFA is applicable only to boilers with special burner design.

Regarding the NOx removal efficiency of OFA, performance test data reported by EPA for three small gas-fired boilers, ranging in size from 22 to 56 MMBtu/hr, showed that controlled levels in the range of 0.073 to 0.142 lb/MMBtu were achieved, with emission reductions of 13% to 73% reported. Data for a 22 MMBtu/hr boiler burning distillate oil showed that emissions were reduced from an uncontrolled level of 0.154 lb/MMBtu to a controlled level of 0.125 lb/MTBtu, an emission reduction of 19 percent.

Flue Gas Recirculation (FGR)

Flue gas or exhaust gas recirculation is a proven control strategy for boilers and heaters. The basic principal of flue gas recirculation (FGR) is to replace a portion of the incoming combustion air with exhaust gas. FGR reduces NOx formation by reducing available oxygen content and by acting as a heat sink to lower peak combustion temperatures. At full-load, this results in a richer burn with more exhaust gas to absorb the heat of combustion, resulting in a lower combustion temperature. NOx removal of up to 40% is achievable by using a maximum recirculation of 30% exhaust gas. FGR with LNB can reduce NOx emissions up to 71%. FGR systems are commercially available, and are therefore technically feasible.

Recently, a new class of ultra-low NOx burners has been developed, which use a combination of techniques. The

burners are designed to recirculate hot oxygen-depleted gases into the combustion zone, thereby maintaining optimum flame temperature, yet reducing NOx by excess air controls.

Staged Combustion Air (SCA)

Another low NOx technology for boilers and heaters is a rich/quench/lean staged combustion design. Air and fuel are injected directly in the combustion zone to mix and combust simultaneously. The off-stoichiometric or staged combustion air method separates the combustion process into two stages: primary and secondary combustion. Primary combustion is the first stage of combustion conducted in a fuel-rich combustion zone. Combustion is then completed at lower temperatures in a secondary, fuel-lean zone.

The fuel-rich first stage inhibits the formation of thermal NOx due to low oxygen levels. Second stage combustion temperatures are below NOx formation temperatures due to the injection of excess air. This design controls both thermal and fuel NOx. Low NOx burners (LNB) achieve reductions in NOx emissions by using multiple combustion stages with varying fuel-air ratios to reduce combustion temperatures and thermal NOx formation.

Good Combustion Practice

Good combustion practice is applicable for all combustion sources. This method requires operating *and* maintaining the equipment according to the manufacturer's recommendations, operator experience, and good arctic engineering practices to obtain maximum fuel efficiency and minimum emissions.

4.1.3 NOx Control for Wartsila Generator MG Seventeen (MG-17)

Cominco plans to operate seven 5000 kW Wartsila generator sets (MG-1 through MG-6, and MG-17) for the Production Rate Increase Project. Wartsila engines MG-1 through MG-6 are existing 5000 kW units that the Department permitted

under PSD in 1988 with operational restrictions. Cominco is proposing to add a seventh 5000 kW Wartsila engine that must undergo BACT analysis as a new emission source.

When the Department issued the preliminary permit decision, the Department also reviewed BACT controls for MG-5. In subsequent negotiations, the Department, EPA and Cominco agreed to remove MG-5 from the BACT assessment. See Section 7 of this report.

Summary of Preliminary Decision and Public Comment

The applicant submitted an application for a construction permit to increase production at the Red Dog Mine. The production rate increase is subject to review under the prevention of significant deterioration (PSD) provisions of the state construction permit regulations, since it will cause significant emission increases in NOx. As a result, the applicant is required to show that BACT for NOx will be installed and used on each new or modified source.

As part of the production increase, the applicant proposed to increase electrical production at the Mine's power plant. In order to do this, the application called for the Department to remove an existing permit limitation that governed the operation of four diesel engines that make-up part of the power plant. This limitation currently restricts the combined operation of these four engines in a manner that would be equivalent to three engines operating full-load for the entire year. Through this permit action, the applicant desires to remove this limitation so the four engines can be operated full-load for the entire year.

In the matter of defining the modification, the applicant proposed that the emissions of three engines be limited according to the original 1988 permit, which allowed the operation of three engines full-load for the entire year. Also, the applicant proposed that the fourth engine, known as MG-5 and considered a standby engine in the 1988 permit, be considered a modified source in this permit action and be

subject to BACT for NOx. The Department concurred with this approach to defining the modification and the engine subject to BACT.

In March 1999, Department staff suggested that the SCR technology was feasible and that SCR may represent BACT for this project on MG-5[3]. In response to this proposed preliminary determination, the applicant proposed an alternate emission reduction strategy to serve as BACT. The applicant also amended the application to include the installation of an additional new engine, known as MG-17. This new engine would also be subject to BACT.

The applicant proposed to retrofit all of the existing, unmodified engines in the power plant with components that would reduce their NOx emissions, including MG-5. MG-17 would be supplied from the manufacturer with the NOx reducing components already installed. From the information presented, the retrofit appears to be equivalent to the manufacturer's most recent stock configuration of the 16V32 engine.

The Department proposed the alternate BACT in its preliminary decision, and argued that the aggregate emission reduction achieved at the power plant was nearly equivalent to the emission rate that could be achieved with SCR on only MG-5 and MG-17.

During the public comment period, the applicant, and the federal land manager objected to the alternate BACT proposal and the Department's judgement of it as meeting BACT. The applicant felt the Department did not use the appropriate standard of review and, if it had done so, would have rejected all control technologies except for the Low NOx package. The federal land manager also claimed the Department did not use the appropriate standard of review.

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[3] March 3, 1999 memo from John M. Stone, ADEC, to Tom Chapple, ADEC.

However, they claimed the Department should have found that catalytic control was BACT.

After the comment period closed, the department, the U.S. EPA, and the applicant entered into discussions concerning the BACT analysis for MG-5 and MG-17. As a result of these discussions, the applicant agreed to restrict the emission increases associated with MG-5 to avoid modification and BACT review.

NOx BACT Analysis for MG-17

The following presents the Department's final BACT review for MG-17 following the step-by-step top-down approach described previously.

Step 1 – Identify All Control Technologies

The sources under review are Wartsila 16V32 internal combustion, compression ignition, reciprocating engines. The engines burn diesel fuel and power 5,000 KW electric generators.

The applicant identified six control technologies for control of NOx that are applicable to the sources. The technologies are selective catalytic reduction, nonselective catalytic reduction, direct water injection, Low NOx components, Fuel Injection Timing Retard (FITR), Operation per design (no control).

In general, the Department concurs with the applicant's identification of available control technologies.

Step 2 – Eliminate the Technically Infeasible Options

The applicant eliminated from consideration non-selective catalytic reduction as being technically infeasible. In the preliminary decision, the Department concurred with the applicant that non-selective catalytic reduction is technically infeasible. This is because the oxygen content of the exhaust gas of the sources is too high.

The Department reviewed and affirms this finding.

Step 3 – Rank the Remaining Control Technologies by Control Effectiveness

By reviewing the application and numerous submittals, one can develop a ranking of the remaining control options by control effectiveness. The Department, in its preliminary decision, did not provide a ranking of the control options by control effectiveness. For purposes of the final evaluation, the technologies were grouped into three control options: catalytic reduction, direct water injection, and the manufacturer's stock engine configuration as of a certain date.

A ranking for the MG-17 by control effectiveness, expressed as percent reduction in NOx from the base case and emission in tons per year after application of the control option, is shown below. The base case of the new engine, MG-17, is the Low NOx configuration.

Control Option	Emission Rate (TPY)	Per Cent Reduction
	MG-17	MG-17
Catalytic Controls	53	90
Direct Water Injection	266	50
Low NOx configuration	531	0

The applicant provided detailed discussion of the economic, environmental, and energy impacts of each control option in the application and numerous addenda.

Step 4 – Evaluate the Most Effective Controls and Document Results

In the application and comments on the Department's preliminary decision, the applicant argued that catalytic controls and direct water injection were not achievable at the Red Dog Mine for energy, environmental, and economic reasons.

They concluded that an emission limit that could be achieved with the Low NOx configuration should be BACT.

In its preliminary decision, the Department argued that an emission rate roughly equivalent to that which could be achieved with catalytic control was BACT. The Department indicated the emission limit could be met by retrofitting all of the engines in the power plant to the 1999 engine configuration. In this way, the Department tempered the stringency of BACT by crediting the applicant with emission reductions from sources that were not part of the permit action. Also, the Department did not reject catalytic controls or direct water injection as BACT due to energy, environmental, or economic considerations.

The applicant, EPA, and the Federal Land Manager criticized the Department's preliminary decision. These parties took exception to the Department's approach in tempering the stringency of BACT by crediting the applicant with emission reductions at existing, unmodified sources. The land manager and the applicant also criticized the Department for not following the top-down approach, in that the Department did not determine that catalytic controls or direct water injection were not achievable at the Red Dog Mine.

The collateral impact clause of the BACT definition allows permitting authorities to temper the stringency of BACT in cases where the energy, environmental, economic impacts, or any combination of these factors that are associated with the use of a control option at a specific facility, are viewed by the review agency as sufficiently adverse as to render the use of that technology inappropriate for a given facility. In this case, the emission reductions achieved by the applicant's proposal to retrofit the existing, unmodified engines into a 1999 configuration is not a consideration of the BACT review provided for by the applicable law or guidelines. Therefore, the Department agrees this approach should not be used to temper the stringency of BACT.

COLLATERAL IMPACTS – CATALYTIC CONTROLS

The applicant believes that catalytic controls for BACT are inappropriate due to adverse environmental, energy, and economic impacts. A summary of the applicant's demonstration and the Department's review of this demonstration follows.

Environmental Impacts

With respect to environmental impacts, the applicant argues there is no environmental benefit from the use of catalytic controls over the least effective control option; no environmental risk to the public exists; and the use of ammonia in catalytic control presents small but serious risks to the workers and visitors.

The applicant also points-out that the emissions from the least effective control option will meet the PSD increments and the ambient air quality standards for NO_2. Further, the applicant states that the catalytic reduction option only achieves a marginal air quality benefit at the ambient air boundary compared to the least effective control option.

With respect to the collateral impact clause, the courts and EPA have determined that ambient air compliance and risk to the public from pollutants regulated under the Clean Air Act cannot be used to reduce the stringency of BACT (See *Columbia Gulf*, 2 E.A.D. at 827). Therefore, the applicant's arguments concerning ambient air benefits and concerns about risk to the public from regulated pollutants are not valid for tempering the stringency of BACT.

The use of ammonia and the risk to workers and visitors from ammonia use is a collateral impact of catalytic controls that can be considered when establishing BACT. Catalytic control requires the use of a reducing agent. There are three reducing agents in common use with catalytic controls: anhydrous ammonia, aqueous ammonia, and urea. The applicant presented two collateral impacts associated with the

reducing agents. The first is accidental release of the agent. The second is environmental impacts caused by excess agent in the exhaust gases of the engines. This second impact is commonly referred to as ammonia slip.

The Department examined the impacts due to ammonia slip. The catalytic control vendor guarantees an ammonia slip rate of 10-ppm or less for three years. Department staff examined the impacts based on an ammonia slip rate of 30-ppm, since it appears, based on the State of Hawaii's experience with catalytic controls on diesel engines, that 30-ppm allows the catalyst to be used for longer periods of time.[4]

Staff modeled the expected maximum ambient impacts caused by 30-ppm slip from two engines running full-load for the entire year and compared the impacts to the state ambient air quality standard for ammonia (human-health based), and to values expected to cause adverse vegetation impacts obtained from a literature search. The expected maximum impact is much less than the state standard, and an order of magnitude less that the lowest value expected to cause adverse vegetation impacts.

The Department also examined the effect of catalytic reduction on the engine exhaust and how this may impact workers and visitors. The modeled results indicate that the maximum ammonia slip rate in the stack is less the OSHA workplace limits. Staff also determined that NOx emissions present a greater impact from an industrial hygiene standpoint than ammonia slip. Therefore, it is likely that the NOx emission reductions resulting from catalytic reduction will improve workplace conditions.

Further, the Department examined the potential for adverse environmental impacts from accidental release of the ammonia reducing agent. To do this, we acquired and reviewed

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[4] August 3, 1999 memorandum from Bill Walker, ADEC, to John Stone, ADEC, Cominco Mine Ammonia Slip.

information from the Institute of Clean Air Companies (ICAC), a nonprofit trade association representing companies that supply air pollution monitoring and control systems, equipment, and services.

According to the ICAC, concern over the handling of ammonia centers on the transportation and storage of anhydrous ammonia under pressure. They believe ammonia use is safe and routine with proper controls, as demonstrated by the excellent overall safety record. The ICAC is unaware of any accidental releases of ammonia used in catalytic control applications that have caused a workplace injury. Gaseous ammonia is used at other facilities in Alaska, primarily as an industrial refrigeration agent. The potential for accidental release and exposure to workers or nearby residents is a risk that requires prudent management controls.

Furthermore, the ICAC says that many current applications of catalytic controls use aqueous ammonia or urea systems to avoid the risk of handling and the safety issues associated with the use of anhydrous ammonia.

The applicant analyzed a urea-based catalytic system as part of their application and concluded that a urea-based system was not achievable because urea has never been demonstrated at a remote site such as the Red Dog Mine. The applicant also contends that a failure of the urea handling and dissolving system could require the engines to be taken offline for extended periods of time due to a subsequent inability to comply with associated emission limits.

To examine this claim, we reviewed the catalytic control vendor's submittal concerning the urea-based system. The vendor, Siemens Westinghouse, specifically states that their proposal takes into consideration special requirements due to the remote location of the Red Dog Mine. The vendor's proposal and guarantee indicate that a urea-based system would be feasible at Red Dog's remote location.

Also, BACT, being a technology-based emission limit, qualifies for consideration under the affirmative defense provisions of Alaska Statute. The affirmative defense statute and regulations are available to the applicant in the event that noncompliance with the BACT limit is due to unavoidable emergency, malfunction, or non-routine repair.

In summary, there is not a compelling case, based upon the information reviewed supporting that ammonia-based or urea-based catalytic control should be rejected due alone to the probable adverse environmental impacts at the Red Dog Mine.

Energy Impacts

In the application and comments, the applicant presents an energy penalty associated with catalytic control and argues this penalty favors the rejection of catalytic control as BACT. It should be noted that this collateral impact only pertains to the modified engine, MG-5. This energy consideration does exist for the new unit, MG-17. Therefore, there are no energy considerations to reject catalytic controls as BACT.

Economic Impacts

In the preliminary decision, the Department recalculated and presented the costs associated with the catalytic control option. The Department did this because the Department disagreed with Cominco on what costs should be included in the economic analysis. As presented, the applicant's cost estimates for catalytic controls appeared to be greater than cost estimates for catalytic controls available to the Department from other sources.

The applicant commented that the Department's economic analysis was flawed. The applicant asserted the Department did not appropriately account for all of the valid costs associated with the loss of heat recovery on MG-5. As MG-5 is no longer subject to BACT, this is no longer an issue.

The Department estimates the capital cost to install catalytic controls on MG-17 at $2.9 million, with an annual operating cost of $635,000. This translates to a cost-effectiveness of $2,100 per ton of NOx removed.

As stated above, the applicant predicted the cost-effectiveness of SCR at approximately $5,600 per ton of NOx removed.[5] The Department and Cominco disagree on the cost estimate.

Despite the differences over cost, the applicant believes the Department should reject catalytic controls due to economic considerations. In the applicant's words the "costs are very significant, affecting Cominco's cost of production and competitiveness in world markets."

The applicant cites several instances where the top-down approach allows permitting authorities to reject a control option for cost considerations.

The first is when an applicant demonstrates, to the satisfaction of the permitting agency, that the costs of pollutant removal for the control alternative are disproportionately high compared to the cost of control in recent permit determinations.

The second is when the cost-effectiveness of a control option is outside the range of costs being borne by similar sources under recent BACT determinations.

The third is when an applicant can demonstrate that the cost of the control option will cause adverse economic impacts to the facility.

The applicant provided a print-out from EPA's RACT/BACT/LAER Clearinghouse database (RBLC) to show that

[5] Table A, Appendix A, February 1999 response to January 28, 1999 ADEC request for more information for Red Dog Mine, Hoefler Consulting Group.

catalytic controls have not been imposed on any similar sources in recent permit determinations. Furthermore, they state that catalytic control has been rejected in the most recent determination in California.

Surveying the RBLC has value; since, in theory, permitting authorities are required to input BACT determinations into the RBLC. However, it would be imprudent to rely completely upon the RBLC, since permitting authorities are recalcitrant in their responsibility of inputting BACT data.

In order to address the applicant's concerns, the Department staff obtained as much information as possible about costs of BACT for similar sources throughout the country. Staff also reviewed the information to see if there is a cost that is considered excessive for BACT.

Every BACT determination for a diesel-fired engine that is listed in the RBLC was reviewed by ADEC. The complete printout is available upon request.

There are no recent BACT determinations for diesel engines used as primary power generation in the RBLC. Moreover, there appear to be only 10 BACT determinations on diesel engines used for primary power generation since 1982. Of these, only one required catalytic controls. Cost data is available for two of the BACT determinations. The cost for both of these 1996 decisions was $432 per ton of NOx removed.

The Department also surveyed the RBLC for recent BACT determinations pertaining to metallic mineral mines. We found one. The facility contained a fuel oil-fired boiler that was required to install BACT at $5000 per ton of NOx removed.

The Department reviewed the Department's recent BACT decisions to determine the cost of NOx BACT. Costs range from $0 to $7,000 per ton of NOx removed. The four recent BACT determinations for diesel-electric generators used for

primary power production range from $0 to $936 per ton of NOx removed. It should be noted that catalytic controls were rejected in two of the decisions because the engines are standby units, although the units are allowed to operate on a part-time basis.

The Department contacted the Air Programs in EPA's Regional Offices to see how much NOx BACT costs in other states, and if there is a cost that is considered excessive for BACT. In general, the Department found there does not appear to be a uniform cost policy that is used throughout the country.

Finally, the Department attempted, but was unable, to determine how much the newer units at electric utilities in the United States pay for air pollution control per unit of power produced. This inquiry was based on the reasoning that the applicant's powerhouse is similar to an electric utility. If catalytic control costs for this permit action were substantially in excess of the amount that utilities are paying nationally for newer units, then the costs for these catalytic controls could be excessive.

Even without the national data, the Department looked at the cost of catalytic controls per unit of power produced for this permit action. If the Department assumes that the engine runs at 80% of full capacity, then approximately 35 million kilowatts of electrical power will be produced each year. The annualized cost of catalytic controls for this unit is approximately $1.0 million. This translates to a unit cost of 3¢ per kilowatt-hour.

If the applicant did not have a powerhouse, it would probably buy power from a rural Alaska utility. From a cursory review, it appears that the average cost of electricity in rural-Alaska is approximately 15¢ per kilowatt hour. Using this cost, catalytic controls would be equivalent to a 20% increase in the electric rate of the facility. In the Department's judgement, this is a disproportionate cost increase when viewed as an electric utility. Furthermore, the cost is significantly

higher on a cost-per-ton removal basis in comparison to the $0 to $936/ton of recent BACT decision [sic] for similar installations.

Another perhaps better way to determine if the cost of BACT is excessive, is for the applicant to present detailed financial information showing its effect on the operation. However, the applicant did not present this information. Therefore, no judgment can be made as to the impact of a $2.1 million control cost on the operation, profitability, and competitiveness of the Red Dog Mine.

The Cominco Red Dog Mine is located within the Northwest Arctic Borough, an area with historical high unemployment and limited permanent year-round job opportunities. During 1997 and 1998, the Borough's unemployment rate has been the highest in the State. The Red Dog Mine, a world-class lead and zinc operation, has a dramatic affect to reverse these historic trends for this region of the State. The Red Dog Mine is the largest private employer within the borough, and represents 14% of the borough's employment. The payroll of $26.4 million represents over a quarter of the borough's total wage and salary.[6]

Before the Mine opened in 1990, borough wages were well below state average wages, with consumer costs 40-45 percent higher than those of Anchorage. The Mine now provides high paying year round employment. Cominco's contributions to the local economy go beyond wages. Cominco's contractors, vendors, and wages have boosted the borough's private sector economy. Employment in the service sector grew by 46% from 1989 through 1992.[7]

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[6] Niel Fried and Brigitta Windisch-Cole, *A Profile: Northwest Arctic Borough*, Alaska Economic Trends, Volume 19, Number 1, January 1999.

[7] Stinson, Hollie, *Northwest Arctic Borough, A Trends Profile*, Alaska Economic Trends, October 1993.

Recent discoveries of additional ore reserves could extend Red Dog Mine's operations for an additional thirty years. With government support and endorsement of Cominco's operations, including the Production Rate Increase Project, the Red Dog Mine will continue to influence and benefit the residents and economy of this region.

The Red Dog Mine plays a unique and continuing impact on the economic diversity of this region. Therefore, the Department has chosen to consider the direct cost of SCR technology and its relationship to retaining the Mine's world competitiveness as it relates to community socioeconomic impacts for the foremost consideration to judge economic impacts of SCR. To support Cominco's Red Dog Mine Production Rate Increase Project, and its contributions to the region, the Department has rejected Selective Catalytic Reduction controls based on excessive economic cost—$2.9 million capital cost, with annualized costs approaching $635,000.

COLLATERAL IMPACTS – DIRECT WATER INJECTION

The applicant believes that direct water injection as BACT is inappropriate due to environmental and economic considerations. A summary of the applicant's demonstration and the Department's review follows.

Environmental Impacts

With respect to environmental impacts, the applicant argues that direct water injection is inappropriate because the amount of water needed for this control option may not be available at the facility. Further, the applicant argues that ice fog may be formed during the winter months leading to worker safety issues.

The lack of water is certainly a valid environmental consideration. However, the applicant did not present substantive factual information about the quantity of water needed for the

control option and its potential availability at the site. According to the applicant, the mine facility has difficulties in providing a high-quality drinking water supply. Without a substantiating analysis, the Department is unable to concur that the applicant has demonstrated that direct water injection is inappropriate due to a lack of water.

With respect to ice fog, the Department can easily address this concern by carefully writing the BACT limit such that direct water injection would not be required at times when ice fog is expected to cause safety problems at the facility. Such a provision would result in higher temporary emissions of NOx.

In summary, although there maybe some compelling water supply problems, there is not sufficient information available to the Department at this time to make a stand-alone decision that the collateral environmental impacts of the direct water injection control option would render it inappropriate as BACT at this facility.

Economic Impacts

The applicant estimates the cost-effectiveness of direct water injection at $6,000 per ton of NOx removed. Cominco argues the "cost is excessive, given that water injection has never been demonstrated in Arctic service, the actual costs associated with the first time retrofit and satisfactory operation of this technology at a remote northern Alaskan facility would undoubtedly be even higher than those shown above, fresh water is still an unresolved issue for the Mine, and should larger volumes of water than 0.5 pounds of water per pound of fuel burned be required the additional cost could be tremendous."

With regard to the questions about the feasibility of this technology in the arctic, the applicant should obtain documentation from the technology manufacturer. If the technology is inappropriate for use in Alaska because of site-specific

concerns, then the applicant should specifically state what the concerns are and why the technology is infeasible.

In order for a technology to be eliminated from consideration, the applicant must clearly document and demonstrate, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option. The applicant has not provided sufficient and compelling information for the Department to reach such a conclusion.

With regard to the cost, it is likely that the cost of this control option is excessive for BACT, since the applicant estimates it is at least as costly as the catalytic control option.

To come to this conclusion, one must concur with the applicant's cost estimate. Yet, the Department disagrees with the applicant's cost estimates.

First, it has not been well established how much water this control option requires. This is important because there are two current sources of water at the facility. One source requires little or no treatment, with corresponding minimal expense. The other requires extensive treatment, with corresponding high expense. It appears the applicant estimated the control cost using the most expensive option. However, there is not enough information in the application to verify this option is actually necessary.

Next, the applicant estimated the operating costs of each direct water injection system at approximately $2,000,000 per year. These costs are not factually supported and at this time are not verifiable by Department staff. This is a significant item and amounts to approximately 80% of the control option cost.

Finally, the direct water injection from the engine manufacturer is estimated to cost $250,000 per engine. The applicant then estimates the capital cost to install this option and build the necessary equipment to supply water will cost approxi-

mately $1,250,000 per engine. Most of this cost is made-up of contingencies (40%) and multipliers.

Without further supporting documentation, the Department can only conclude that these costs are unusually high, and without further explanation, the Department cannot verify the estimates even if plausible reasons do exist to support such costs.

Having identified the Department's reservations regarding the estimates put forward by the applicant, the Department has not prepared an alternative cost estimate. Furthermore, the Department has no substantive data whereby costs would be substantively lower than the Department's calculated costs for SCR controls. Therefore, the Department concludes that economic cost of this technology would be at least comparable with that of SCR, and overall would constitute a disproportionate cost of controls.

BACT decision for Wartsila Generator Seventeen (MG-17)

In final permit negotiations with U.S. EPA and the applicant, the Department has imposed a cumulative NOx emission limit for Unit MG-5 to avoid BACT review under PSD. Therefore, the Department has imposed no BACT limit for MG-5 in the final permit decision.

The Department finds an emission rate achievable with Low NOx controls to be BACT on diesel generator MG-17. A vendor-guaranteed emission rate of 121.3 lb/hour is representative of the NOx reduction expected of the Low NOx controls selected as BACT. Section 4, Condition 20 requires unit MG-17 to meet an emission rate limit of 121.3 lb/hour representative of BACT. Condition 20 requires source testing within 180 days upon start-up for MG-17 to demonstrate compliance with the BACT requirement. Permit Section 9, Condition 40, requires reporting the source test results.

* * *

7. PERMIT ADMINISTRATION

The Department has prepared Air Quality Control Construction Permit 9932-AC005 for Cominco Alaska, Inc., to modify the Cominco Red Dog Mine Facility. The Permit authorizes Cominco to install and operate the proposed emission units, and relocate existing emission units to the Cominco Red Dog Mine Facility in accordance with 18 AAC 50.315 and AS 46.14.170.

In response to public comments and in order to comport with the Department's Operating Permit style, the Department revised the Final Draft Construction Permit for Cominco's Production Rate Increase project. The Department included twenty-one sections in this permit draft.

7.1 Permit Content

All facilities permitted under the Air Quality Control Rules are under the purview of the Department's Air Permits Program. The Program's Inspection Service Group has oversight for all reports, surveillance, records, and inspections of permitted facilities. Therefore, all plans, reports, and notices required under this Permit (No. 9932-AC005) should be submitted to the Group's Fairbanks Office, as provided for in Section 10, Condition 48, of the Construction Permit.

In accord with 18 AAC 50.320, the Department incorporated:

- The terms and Conditions of Cominco's previous Air Quality Permit Number 9332-AA003, except as revised or rescinded in this permit in Section 1, Condition 1.
- General Permit Conditions listed in 18 AAC 50.345(a) as Section 1, Conditions 2 through 8 of the Construction Permit.
- Section 2 includes conditions to restrict operations, emissions, and fuel properties during stages of the Production Rate Increase Project in order for the project to

comply with ambient standards and increments. The Department imposed emission limits in Section 2, Condition 14, to cap NOx emissions to no greater than 3,878 tons per year. This limit is necessary for the Red Dog Mine Facility activities to comply with the NO_2 increment.

- Section 3 incorporates owner-requested limits to avoid PSD review for carbon monoxide and sulfur dioxide, and to avoid particulate and NOx BACT review for MG-1 through MG-6.
- Sections 4 and 5 incorporate BACT emission limits, with monitoring, record keeping, and reporting requirements for NOx, PM, and volatile organic compounds.
- Sections 6 and 7 incorporate applicable federal emission standards by reference. The sections of the federal standards applicable for the project are included in Sections 16 through 21.
- Section 8 incorporates State emission standards for incinerators, fuel burning equipment, and industrial processes, open burning, and air pollution prohibitions. The Section also includes monitoring, record keeping, and reporting requirements for each section. Finally, the Section includes a permit term for good air pollution control practices.
- Section 9 lists general source testing and monitoring requirements for this permit.
- Monitoring, record keeping, and reporting obligations are listed in Section 10.
- Section 11 lists the source inventory for the Cominco Red Dog Mine Facility. This list includes permanent fuel burning equipment, incinerators, and industrial processes, with both point and fugitive sources of air contaminants.

- Section 12 contains the permit application documentation that Cominco has provided for the Production Rate Increase Project.
- Section 13 includes the visible emission surveillance procedures and forms for documenting surveillance of emission units at the Red Dog Mine.
- Section 14 includes an Excess Emission Notification Form for Cominco to report operations and emission deviations from the permit terms.
- The Department revised Cominco's Public Access Control Plan in order to make provisions practically enforceable. This revision, with sign posting requirements, is included in Section 15.

Based on a June 23, 1999 discussions with U.S. EPA Region X, the Department added the 1988 NOx BACT emission limits for Sources MG-1, and MG-3, through MG-5 in Permit Section 4, Condition 20. The Department concurred with EPA that the decision to issue Permit 9332-AA003 did not give due notice and public process for revising or rescinding the 1988 NOx BACT limit. Therefore, that 1994 permit decision appears to be in error. To correct that oversight, the Department reinstated the limits. For the 2259 ton per year NOx limit, the Department further adjusted the limit to a 12-month rolling total to ensure that the limit is practically enforceable under Federal guidelines. The Department has added emission monitoring and reporting for these two limits in Condition 20.

7.2 Owner requested Operation and Emission Limits

The Department has incorporated into the construction permit several owner-requested limits provided in the permit applications and supplements. These limits, their monitoring, record-keeping, and reporting obligations establish the basis to ensure the permittee modifies the facility as set out in the application documents. The Department also imposed a

cumulative NOx emission limit of 2259 tons per year for MG-1 and MG-3 through MG-5 in condition 18, to avoid U.S. EPA objection to the final permit decision. This cumulative limit represents the Department's 1988 PSD decision for power plant NOx emissions.

In the April application supplement, Cominco proposed to rebuild each of the existing six Wartsila 5 MW generators, MG-1 through MG-6, with low emission parts (Cominco 1999e). Units MG-1 and MG-3 through MG-5 will require camshaft replacement to complete the retrofit with low emission parts. Units MG-2 and MG-6 previously incorporated this portion of the low emission retrofit during the Department's 1994 PSD permit decision. Further, Cominco proposed to adjust the fuel-injection timing retard to ensure compliance with a 121.6 lb/hour NOx emission rate. The Department has not retained this owner-requested limit, but replaced it with an equivalent total NOx emission rate of 2259 tons per twelve-month period, in Condition 18.

* * *

New Unit SCR

Selective Catalytic Reduction Capital Costs (MG-17)
SCR/Urea
BASED ON THE APPLICANTS METHODS, WITH DEC MODIFICATIONS.

Purchased Equipment Costs

A.	Basic Equipment & Auxiliaries: Retrofit (Siemens Estimate)	$490,000
B.	Water Pretreatment System	$20,000
C.	Freight and Taxes (0.1x(A+B))	$51,000
D.	Total Equipment Cost (TEC)	$561,000

Construction Costs

E.	Foundations and Supports (0.08 x TEC)	$44,880
F.	Erection and Handling (0.14 x TEC)	$78,540
G.	Electrical (0.04 x TEX)	$22,440
H.	Piping (0.02 x TEC)	$11,220
I.	Insulation (0.01 x TEC)	$5,610
J.	Painting (0.01 x TEC)	$5,610
K.	Total Construction Costs	$168,300
L.	Total Direct Costs (TDC)	$729,300

Building Costs

M.	Red Dog Module Cost, 75ft x 30ft $ 500 per square foot	$1,125,000

INDIRECT COSTS

N.	Engineering and Supervision (0.3 x (TEC))	$168,300
O.	Construction and Field Expenses (0.05 x (TEC))	$28,050
P.	Construction Fee Multiple Contractors (0.20 x (TEC))	$112,200
Q.	Startup (0.02 x TEC)	$11,220
R.	Performance Test (0.01 x TEC)	$5,610
S.	Total Indirect Costs (TIC)	$325,380
T.	Remote Site Construction and Installation (0.4 x (see note below))	$83,252
U.	TOTAL DIRECT AND INDIRECT COSTS	$2,262,932
V.	Contingency (0.3 x (TOTAL DIRECT AND INDIRECT COSTS)	$678,880
W.	TOTAL INSTALLED CAPITAL COSTS (TCC)	$2,941,812

Selective Catalytic Reduction Annualized Costs
SCR/Urea; 10 yr Amortization

DIRECT COSTS

X.	Operating and Maintenance Labor (1 employee x $50/hr x 6 hrs/day x365 days/yr)	$109,500
Y.	Supervisory Labor (0.15 x OLM)	$16,425
Z.	Parts and Materials (0.1 x Basic Equipment + water treatment)	$51,000
AA.	Catalyst Replacement ($75,000 every three years @ 7%)	$28,579
BB.	Urea Usage ($0.08/lb at 145.5 lb/hr)+$0.05/lb freight)	$165,695
CC.	TOTAL DIRECT COSTS	$371,199

INDIRECT COSTS

DD.	Overhead (0.80 x total labor)	$100,740
EE.	Property Tax (0.01 x TCC)	$29,418
FF.	Insurance (0.01 x TCC)	$29,418
GG.	G and A Charges (0.02 x TCC)	$58,836
HH.	Capital Recovery (0.142 x TCC) 10 years at 7 percent	$417,737
II.	TOTAL INDIRECT COSTS	$636,150
JJ.	TOTAL ANNUALIZED COSTS	$1,007,349
KK.	TOTAL TONS PER YEAR NOx REMOVED	478
LL.	COST EFFECTIVENESS (per ton NOx removed)	$2,107

Note: this analysis is based on the analyses presented in Cominco's February 10, 1999 *Air Quality Control Construction Permit: Response to January 28, 1999 ADEC Request for More Information.*

The Remote Site Construction and Installation has been modified from Cominco's method. Expenses included are Foundation and Supports, Erection and Handling, Startup, Performance tests, and the portion of Engineering, Supervision due to installation at Red Dog.

Electrical changes from 0.2 to 0.04 per Vatavuk's *Estimating Costs of Air Pollution Control*, page 21. Piping changed from 0.2 to 0.02 per Vatavuk page 21.

Capital Recovery changed from 10% to 7% per EPA guidance.

Urea usage has been changed to 145.5 lb/hr based on the Siemens estimate of ammonia requirements found on page 11 of Appendix C of Cominco's *Air Quality Control Construction Permit: Response to January 28, 1999 ADEC Request for More Information.*

The cost of the water pretreatment system has been changed based on a 2/27/99 telephone conversation with *Culligan* a vendor of RO equipment.

The tons of NOx removed was calculated using a 90% reduction from a base case of 121.3 lb/hr for a stock engine outfitted with the standard Low NOx components.

Retrofit SCR

Selective Catalytic Reduction Capital Costs (MG-5)
SCR/Urea; Waste Heat Generator Relocated to MG-6
BASED ON THE APPLICANTS METHODS, WITH DEC MODIFICATIONS.

Purchased Equipment Costs

A.	Basic Equipment & Auxiliaries: Retrofit (Siemens Estimate)	$490,000
B.	Waste Heat Generator	$237,000
C.	Water Pretreatment System	$20,000
D.	Freight and Taxes (0.1x(A+B+C))	$74,700
E.	Total Equipment Cost (TEC)	$821,700

Construction Costs

F.	Foundations and Supports (0.08 x TEC)	$65,736
G.	Erection and Handling (0.14 x TEC)	$115,038
H.	Electrical (0.04 x TEX)	$32,868
I.	Piping (0.02 x TEC)	$16,434
J.	Insulation (0.01 x TEC)	$8,217
K.	Painting (0.01 x TEC)	$8,217
L.	Total Construction Costs	$246,510
M.	Total Direct Costs (TDC)	$1,068,210

Building Costs

N.	Red Dog Module Cost (RDM) 75ft x 30ft $ 500 per square foot	$1,125,000

INDIRECT COSTS

O.	Engineering and Supervision (0.3 x (TEC))	$246,510
P.	Construction and Field Expenses (0.05 x (TEC))	$41,085
Q.	Construction Fee Multiple Contractors (0.20 x (TEC))	$164,340
R.	Startup (0.02 x TEC)	$16,434
S.	Performance Test (0.01 x TEC)	$8,217
T.	Total Indirect Costs (TIC)	$476,586
U.	Remote Site Construction and Installation (0.4 x (see note below))	$121,940
V.	TOTAL DIRECT AND INDIRECT COSTS	$2,791,736
W.	Contingency (0.3 x (TOTAL DIRECT AND INDIRECT COSTS)	$837,521
X.	TOTAL INSTALLED CAPITAL COSTS (TCC)	$3,629,257

Selective Catalytic Reduction Annualized Costs
SCR/Urea; Waste Heat Generator Relocated to MG-6,
10 yr Amortization

DIRECT COSTS

Y.	Operating and Maintenance Labor (1 employee x $50/hr x 6 hrs/day x365 days/yr)	$109,500
Z.	Supervisory Labor (0.15 x OLM)	$16,425
AA.	Parts and Materials (0.1 x Basic Equipment + water treatment)	$51,000
BB.	Catalyst Replacement ($75,000 every three years)	$25,000
CC.	Urea Usage ($0.08/lb at 145.5 lb/hr)+$0.05/lb freight)	$165,695
DD.	TOTAL DIRECT COSTS	$367,620

INDIRECT COSTS

EE.	Overhead (0.80 x total labor)	$100,740
FF.	Property Tax (0.01 x TCC)	$36,293
GG.	Insurance (0.01 x TCC)	$36,293
HH.	G and A Charges (0.02 x TCC)	$72,585
II.	Capital Recovery (0.142 x TCC) 10 years at 7 percent	$515,355
JJ.	TOTAL INDIRECT COSTS	$761,265
KK.	TOTAL ANNUALIZED COSTS	$1,128,885
LL.	TOTAL TONS PER YEAR NOx REMOVED	478
MM.	COST EFFECTIVENESS (per ton NOx removed)	$2,361

Note: this analysis is based on the analyses presented in Cominco's February 10, 1999 *Air Quality Control Construction Permit: Response to January 28, 1999 ADEC Request for More Information*.

The Remote Site Construction and Installation has been modified from Cominco's method. Expenses included are Foundation and Supports, Erection and Handling, Startup, Performance tests, and the portion of Engineering, Supervision due to installation at Red Dog.

Electrical changes from 0.2 to 0.04 per Vatavuk's *Estimating Costs of Air Pollution Control*, page 21. Piping changed from 0.2 to 0.02 per Vatavuk page 21.

Capital Recovery changed from 10% to 7% per EPA guidance.

Urea usage has been changed to 145.5 lb/hr based on the Siemens estimate of ammonia requirements found on page 11 of Appendix C of Cominco's *Air Quality Control Construction Permit: Response to January 28, 1999 ADEC Request for More Information*.

The cost of the water pretreatment system has been changed based on a 2/27/99 telephone conversation with *Culligan* a vendor of RO equipment.

The tons of NOx removed was calculated using a 90% reduction from a base case of 121.3 lb/hr for an engine for an uncontrolled engine rebuilt with the standard Low NOx components.

The cost of rebuilding was not included as a rebuild was recommended by the vendor based on engine wear. Rebuilding using Low NOx parts has two justifications. Page 7 of the vendor data states that the Low NOx parts are 'today's standard.' Page 4 of the vendor data states that there is a 5% reduction in fuel consumption. The fuel savings offsets the costs of installing Low NOX parts. The Low NOX vendor data is found in Appendix F of Cominco's June 1998,

Application for an Air Quality Control Construction Permit: Production Rate Increase.

Production Loss and Backup Generator Rental Costs have been Eliminated due to the April 1, 1999 E-mail from Paul Dusenbury stating that the glycol loop allows each engine to be isolated for routine maintenance.

RESPONSE TO COMMENTS
COMINCO ALASKA
RED DOG MINE
PRODUCTION RATE INCREASE PROJECT
AIR QUALITY CONSTRUCTION PERMITS
No. 9932-AC005

On April 29, 1999, the Department of Environmental Conservation (Department) issued a public notice soliciting comments regarding the preliminary construction permit decision for Cominco Alaska's requested facility modification to their Red Dog Mine known as the Production Rate Increase Project (PRI). The PRI includes the removal of a power production cap, the installation of a new 5 MW generator, the operation of a new grinding circuit, plus the installation of other ancillary emission sources. In addition to the new equipment being installed, the PRI included many existing small sources that were not reviewed under the pre-construction review criteria of the Alaska Air Quality Control Prevention of Significant Deterioration Program.

The Department accepted comments on the preliminary decisions through the close of business on June 7, 1999. The Department received comments from the applicant, the U.S. Department of Interior National Park Service (NPS), Trustees for Alaska, Center for Science in Public Participation, Alaska Community Action on Toxics, Bob Robinson, and Ernest Dummann.

PERMIT COMMENTS

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B. Response to Comments, John Notar, U.S. National Park Service, June 4, 1999

1. General Best Available Control Technology (BACT)--Although it is unclear from the information available to us, it appears that the current PSD review is restricted to only the most recently proposed increase in production and equipment

being added. We believe that the emission units reviewed under PSD should be expanded and reviewed using current PSD policies and procedures. For example, Units MG-1, 3, 4, and 5 would be allowed to increase hours of operation (resulting in a significant emission increase) and a seventh generator added, only MG-5 and MG-17 were subject to BACT. As a consequence, Cominco used a trade to "net" out of BACT by agreeing to reduce emissions on MG-1, 3, and 4 (which should be subject to BACT) in return for higher emissions from MG-5 and 17.

The current PSD review is restricted to the Production Rate Increase equipment modifications and new equipment. In addition, Cominco identified that existing emission units are on-site at the Mine, not listed on the current permit, and not reviewed for BACT when installed. Cominco requested that the Department assess BACT for these unlisted emission units under the purview of this Construction Permit. Regarding the Department's proposal to increase the power production from Units MG-1, 3, and 4 without a BACT assessment, the Department has considered the history, intent, and purpose of the kW-hr operational limit[4]. Based on this consideration and discussions with the U.S. EPA and applicant, the Department is adding MG-5 to the "net," removing the operational limit, yet retaining the 1988 emission limit of 2259 tons of NOx per year which is the basis for the kW-hr limit. In addition, the Department has retained the 1988 NOx BACT limit of 750 ppmvd, corrected for 15% oxygen in the exhaust gas. Therefore, the Department has ensured that the four units in question are not modifications subject to BACT review under the Clean Air Act. The Department has re-assessed BACT for the MG-17 unit to dismiss the netting approach for BACT economic costs documented in the

[4] ADEC, August 13, 1999, memorandum, Cominco kW-hr Limit, Brian Renninger, author.

preliminary permit decision[5]. See Conditions 18 and 20 of the final permit decision.

2. EPA policy requires that an operation limit relaxation triggers review as if the units were new. We recommend that the entire Red Dog Facility be subject to PSD review to capture the complete impact of the facility and ensure that no emission unit has circumvented full PSD review through incremental increases in operation.

Response: The Department does not concur with the commentator that the entire Red Dog Mine Facility be subject to PSD review at this time. The Department initially permitted the Red Dog Mine Facility on June 17, 1988 under the State PSD program, approved by the U.S. Environmental Protection Agency (U.S. EPA). The Department reviewed Sources MG-1 through MG-5 for NOx BACT at that time. On July 27, 1994, the Department issued a final permit decision under the State PSD program to rebuild Source MG-2 and install Source MG-6. Since the facility and emission sources have not circumvented PSD review, the Department is therefore limiting its review to the production rate increase modifications. Requirements for BACT are as set out in 18 AAC 50.315(e)(3) for the State-approved PSD program, and 40 CFR 51.166(j)(3) for plan requirement elements necessary for U.S. EPA approval of the PSD program.

* * *

4. NOx BACT--ADEC correctly concluded that SCR represents BACT for the 5 MW generators. However, ADEC's decision that generators MG-3 and 4 were not subject to BACT allows a netting approach among several generators which is neither allowed by BACT, nor achieves the degree of reduction to result if all generators are subject to BACT

[5] ADEC, August 11, 1999 memorandum, Cominco Red Dog – Final Permit Action X065, BACT Analysis for NOx on MG-5 and MG-17, John Stone, author.

and equipped with SCR. Nitrogen oxide emissions could affect vegetation at Cape Krusenstern National Monument and Noatak National Preserve. Anthropogenic nitrogen can alter composition of plant communities, favoring those species most responsive to nitrogen inputs. Therefore, we encourage the Department to minimize NOx emissions from the project.

Response: The Department did not find that SCR represents BACT in the preliminary technical analysis report. The Department reassessed the netting approach in consideration of the National Park Service comment, and found that retrofit low NOx technology on all 7 engines does result in a greater degree of emission control from the Cominco Power Plant than applying SCR controls on 2 engines[6]. However, the Department in consideration of the comments from U.S. EPA, National Park Service and Cominco Alaska, Inc., has re-evaluated the BACT assessment to remove ambiguity regarding adequacy of the Department's BACT determination[7]. Please refer to section 4.1 of the Department's final Technical Analysis Report.

* * *

G. Response to Comments, Hoefler Consulting Group on behalf of Cominco Alaska, Inc., June 4, 1999

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9. Condition IV.B--MG-17 is scheduled for installation in the third quarter of 2000. The contract will be signed after this permit decision is issued. Retrofitting the existing six

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[6] ADEC, Cominco Red Dog Mine Power Plant NOx Emission Comparison PSD BACT Options, August 13, 1999, Jim Baumgartner, author.

[7] ADEC, August 11, 1999 memorandum, Cominco Red Dog – Final Permit Action X065, BACT Analysis for NOx on MG-5 and MG-17, John Stone, author.

Wartsila engines with low emission components requires that each engine be taken off-line for two weeks. Because of the down-time, the program can be completed more efficiently if each retrofit is scheduling during a regularly scheduled engine over-haul, or after MG-17 is installed.

Under this approach, two existing engines would be completely retrofitted in 1999. Retrofitting of the remaining four existing engines would be completed after installation of MG-17, but before the end of 2000.

Alternatively, the retrofit schedule can be accelerated five months if back-up Caterpillar generators MG-7 through MG-9 are operated during the retrofit periods instead of waiting for MG-17. The MG-7 through MG-9 sources are subject to an operating limit of 1,690,000 kW-hour/year. However, operating these generators to accelerate the retrofit schedule will reduce NOx emissions because the NOx emission reductions from the Wartsila engines occur sooner. The reduction is 56.5 and 13.7 TPY NOx for uncontrolled and FITR controlled Wartsila engines respectively.

Cominco requests replacement language for Condition IV.B to accommodate the retrofit.

> Re-cam and rebuild each of Wartsila sources MG-1 and MG-3 through MG-5 with low emission retrofit parts and rebuild each of Warstila sources MG-2 and MG-6 with low emission parts such that 2 engine rebuilds are completed before December 31, 1999 and 4 engine rebuilds are completed before December 31, 2000. Complete the installation of new Wartsila source MG-17 before December 31, 2000.
>
> As an option, re-cam and rebuild each of Wartsila sources MG-1 and MG-3 through MG-5 with low emission retrofit parts and rebuild each of Wartsila sources MG-2 and MG-6 with low emission retrofit parts such that all engine rebuilds are completed before July 31, 2000. The Caterpillar 3508TA supplemental power engines, sources

MG-7, MG-8 and MG-9 may each be operated for up to 218,400 kilowatt-hours during each Wartsila rebuilding period. Operating MG-7, MG-8 and MG-9 under this condition is in addition to the 1,690,000 kilowatt-hours per year allowed under Condition VI.A.9.

Response: In order to protect the NO_2 increment, the Department has capped the cumulative NOx emissions from Sources MG-1 through MG-6 and MG-17 in Condition 14 of the draft final permit at the 3,878 ton per year maximum NOx emission rate upon which Cominco modeled for these sources. The Department has added monitoring and reporting requirements to ensure the ton per year emission rate is enforceable. See Condition 14 of the final permit. Therefore, the Department has agreed to drop the requirement for Cominco to have the retrofit controls in place before Source MG-17 is installed. Please note that operational limits on MG-1, and MG-3 through MG-5 are retained until Cominco installs the Low NOx retrofit controls, as set out in Condition 18 of the final permit. For MG-5, this ensures that BACT controls are installed before the source is modified through removal of the operational limit.

* * *

44. Conditions XI.A.1.a(2), b(2), XI.B.1(d), and XI.C.2(a)-- Cominco requests that the conditions be deleted as $7,086 per ton removed is excessive. Cominco also believes that ADEC underestimated costs. The high cost per ton and small total amount of NOx reduction does not support concluding that low NOx burners and FGR are BACT for sources MH-1 through MH-3.

Response: ADEC's cost effectiveness assessment was based on Cominco's June 1988 application that gave 80% control efficiency for low NOx burners with flue gas recirculation (LNB/FGR). Cominco's October 1998 supplement corrected the expected control efficiency estimate to 50%. The reduction in control efficiency increases the cost control of LNB/FGR from $4,400/ton to $7,086/ton. While the cost of

control has increased, this type of control technology is still within the range considered feasible by the Department and the EPA on sources of this type.

Cominco has stated, without saying why, that even taking into account of the revised control efficiency that the $7,086/ton estimated costs are an underestimate. The Department described in the preliminary TAR the two changes made to Cominco's estimate. The Department changed the 70% contingency cost to 30% to maintain consistency with the contingency estimate of 30% that the Department has been allowing other applicants. The capital recovery factor was changed by the Department to reflect EPA's guidance in their January 26, 1999 letter to the Department. Other than those two changes, the analysis is Cominco's. Cominco's comments did not address why these two changes lead to an underestimation in costs. It should be noted that the Department's analysis retained several costs that Cominco included in their original estimate -- such as $18,150 for foundations and supports, erection and handling, electrical, piping, insulation, and painting. Cominco has provided no explanation of how these costs are pertinent to retrofitting a heater with LNB/FGR. The Department finds that the estimated costs of this technology to err on the side of being conservatively high.

The emission rate determined as BACT in Condition XI.A.1.b(2) has been modified to reflect the updated expected emission reduction. The updated NOx BACT emission rate for heaters MH-1, MH-2, and MH-3 is 0.084 lbs./MMBtu. See Section 4, Condition 20.5.

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TECHNICAL ANALYSIS REPORT

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C. Response to Comments, Hoefler Consulting Group on behalf of Cominco Alaska, Inc., June 4, 1999

* * *

3. Executive Summary, Finding 13--Cominco requests that Finding 13 be modified to fully and accurately characterize Cominco's proposal. Cominco also requested that Low NOx be installed on MG-1, MG-2, MG-3, MG-4 and MG-6 as BACT for those engines.

Response: The Department agrees to modify the finding to fully describe Cominco's proposal. Regarding Cominco's assertion that Low NOx be installed on MG-1 through MG-6 as BACT, the Department does not concur. BACT is applied to new and modified emission sources through pre-construction review under the pre-construction provisions of the Prevention of Significant Deterioration Program as delegated to the State of Alaska. Of the Wartsila generators at the Red Dog Mine, only unit MG-17 requires BACT as the result of the Production Increase Project. The Department has retained BACT emission limits imposed in 1988 for Units MG-1, MG-3, MG-4, and MG-5. The owner-requested limit of 2259 tons per year renders modification of these five sources as moot. The department has retained the 135 lb/hour NOx BACT limit for Sources MG-2 and MG-6a.

* * *

12. Section 4.1.3--ADEC has prepared a BACT analysis for NOx for the Wartsila engines at the mine for which the Department found Low NOx controls to be BACT on diesel generators MG-5 and MG-17. Cominco agrees, and requests that the Department find low NOx controls as BACT for MG-1 through MG-4 and MG-6 as well.

Response: The Department questions whether it has authority to impose BACT on unmodified emission units. The Department concurs that Low NOx emissions are warranted on MG-1-MG6 to protect ambient air quality, to meet the 750 ppmv 1988 NOx BACT limit for MG-1, MG-3, and MG-4, and meet the 135 lb/hour 1994 NOx BACT limit for MG-2 and MG-6. Although the Department concurs that the 121.3 lb/hour owner-requested limit for MG-2 and MG-6 renders moot the 1994 NOx BACT limit of 135 lb/hour, the Department has not imposed this limit on MG-2 and MG-6.

Cominco believes that SCR is not BACT for the generators at the Red Dog Mine. The statutory and regulatory factors that must be weighed in selecting BACT are environmental, energy and economic considerations. A reasonable and fair weighing of these factors demonstrate that SCR is not BACT and that Low NOx is BACT.

That SCR is not BACT is proven by the fact that ADEC itself has not found SCR to be BACT for several recent BACT determinations in Unalaska, St. Paul and Ketchikan. For Ketchikan, SCR was not required even though the emission[s] occur in a populated area, the emissions have far greater environmental impacts, the emissions did not result in energy penalties, and SCR was far less costly.

ADEC is not alone in never having required SCR as BACT for such engines. Neither EPA nor any state has required SCR as BACT on such engines. In short, the overwhelming authority throughout the nation and Alaska is that SCR is not BACT for such engines. ADEC would be extremely arbitrary to consider SCR as BACT at the Red Dog Mine circumstances where a weighing of factors even more clearly leads to rejection of SCR as BACT.

Response: The cited examples of engines permitted in Alaska without requiring SCR are not valid examples as they either took place over 18 months ago or were not used for similar

purposes[28]. The Department has permitted projects requiring SCR. The Kensington Gold Project and University of Alaska Fairbanks avoided PSD major classification by proposing to install SCR on their Wartsila engines[29].

The Department disagrees that no state has required SCR as BACT on diesel fired engines. The Department found in the RACT/BACT/LAER Clearinghouse, decisions mandating SCR on diesel engines in four states, some as early as 1989[30].

The Department agrees that the statutory and regulatory factors that must be weighed in selecting BACT are environmental, energy and economic considerations. The Department has revised the final Technical Analysis Report in consideration of the commentator's issue.

While Cominco agrees with ADEC's conclusion that low NOx is BACT, Cominco believes that the analysis is incomplete and faulty in numerous legal, factual, and technical respects that should be remedied in reaching a final decision. In these comments, Cominco will discuss the defects in the analysis to provide the necessary support for the decision that low NOx is BACT for the engines.

The analysis purports to apply EPA's "top-down" approach to BACT analysis. ADEC summarizes as starting with the technology ranked as the most effective control for the pollutant and considering other technologies ranked according to their control effectiveness. The analysis says on Page 27, that if the top ranked is shown to be "inappropriate through economic, environmental, or energy impacts, then it is eliminated...."

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[28] ADEC, August 10, 1999, memorandum, Cominco NOx BACT, Brian Renninger, author, attachment A, pages 11 and 12.

[29] Ibid. attachment A, page 15.

[30] Ibid. attachment A, pages 15 and 16.

The analysis in the TAR only considers SCR. With respect to SCR, the analysis does not consider environmental or energy factors, but only technical and economic feasibility. Thus on its face, the analysis is inadequate, even for SCR. However, ADEC does not eliminate SCR based on a weighing of the considerations as "top-down" methodology would require before moving on to consider low NOx, but instead simply finds that SCR is feasible. The analysis then compares the emission reduction obtained from installing low NOx on seven engines to the NOx emission reduction obtained from installing SCR on two engines, finding that the small amount of additional emission reduction obtained from SCR would be exorbitant.

Federal and State law require that a BACT analysis consider and weigh "energy, environmental, and economic and other costs... The BACT analysis is contained at pages 38 through 44 of the preliminary TAR. The headings are "Selective Catalytic Reduction," "Technical Feasibility," "Economic Feasibility," and "BACT decision" for Wartsila Generator Five (MG-5) and Seventeen (MG-17)." No heading exists for and virtually no weighing is provided of the environmental or economic impacts of SCR. Further, no consideration is given to significant, determinative technical faets bearing on technical and economic feasibility, such as the inability to move the waste heat generator currently on MG-5. No heading exists for "Low NOx," much less an analysis of relative impacts, even though Low NOx is selected as BACT.

Cominco has been required to submit extensive information on SCR and Low NOx and has done so in numerous responses to ADEC requests for information and presentations to ADEC. Little of that information has been considered in the preliminary TAR or rationale for the decision. That information is summarized in the BACT section of Cominco's *Presentation To Alaska Department of Environmental Conservation of Major Discretionary Air Quality Issues*

Pending Decision At Cominco's Red Dog Mine dated March 3, 1999, Attachment A.

Cominco submits that the final TAR should be amended to include the required consideration and weighing of the statutory and regulatory factors not yet considered in the TAR in arriving at the decision that Low NOx is BACT for MG-5 and MG-17. The following is the consideration Cominco believes is appropriate and supported by Cominco's prior submissions to ADEC.

Response: The preliminary TAR did perform a 'Top-Down' analysis of SCR.. The analysis in the preliminary TAR evaluated the energy, environmental, and economic criteria raised by Cominco within the Technical Feasibility and Economic Feasibility sections on pages 39 and 40. 'Top-Down' analysis does not require that each technology be compared but that the technologies stand or fall on their own merit. Since the preliminary TAR found SCR as both economic and technically feasible, the consideration of lesser controls was not required. The Department did not impose the technology indicated by the 'Top Down' analysis included in the TAR but, as stated on page 42 of the preliminary TAR, an alternative proposal presented by Cominco. While Cominco comments that the Department did not perform a 'Top-Down' Analysis and references the March 3, document found in Attachment A of Cominco's comments, that document is also not a 'Top Down' analysis. The Department has prepared a detailed response to the analysis included in Attachment A of Cominco's comments[31].

The Department has prepared a new 'Top-Down' BACT analysis that supplants the analysis found in the preliminary

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[31] ADEC, August 10, 1999, memorandum, Cominco NOx BACT, Brian Renninger, author.

TAR.[32] *This analysis includes a Top-Down BACT analysis taking into account the environmental, energy, and economic impacts to accommodate Cominco's comments.*

13. BACT--Environmental Impacts of SCR and low NOx.

SCR and low NOx both prevent significant deterioration by only allowing emissions that cause modeled ambient impacts that are within the NO_2 increment limit. An insignificant difference of 1.6 micrograms per cubic meter exists between the impacts from MG-5 and MG-17 equipped with SCR (22.7 ug/m3) versus Low NOx (24.3 ug/m3).

The total impact of the two engines equipped with either SCR or Low NOx produces a maximum modeled ambient impact one-third of the NO_2 primary and secondary standards selected to protect public health with an adequate margin of safety, and welfare.

Response: The Department has reason to expect that uncontrolled operation of Red Dog sources MG-1 through MG-6 would lead to NOx emissions exceeding the maximum allowable concentration increase allowed under 18 AAC 50.020(b)(2)[33]*. Cominco has voluntarily offered to retrofit sources MG-1 through MG-6 with Low NOx components. With this voluntary action, Cominco has submitted an analysis that shows that the maximum allowable NOx increase detailed in 18 AAC 50.020(b)(2) will not be exceeded.*

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[32] ADEC, August 11, 1999, memorandum, Cominco Red Dog – Final Permit Action X065, BACT Analysis for NOx on MG-5 and MG-17, John Stone, author.

[33] ADEC, August 12, 1999, memorandum, Owner-requested Limits and Ambient Impacts for Specified Stack Parameters, Jeff Anderson, author.

No public presence or residence exists within tens of miles of the mine. The nearest public use is a winter trail crossing many miles distant from the mine. As a result, no significant or real world public exposure exists.

Response: The Department's air quality control oversight extends beyond public exposure. The Department retains a role to protect the environment, as expressed as air quality-related values. Section 1 of AS 46.14 states the policy and purposes of the Air Quality Control Program as follows. "It is the policy of the state to have a program to prevent, abate, control, and identify air pollution that complies with 42 U.S.C. 7401-7671q (Clean Air Act), as amended, and federal regulations adopted under those laws."

SCR requires use of ammonia. The risk of ammonia release and worker exposure will exist from the use of SCR at the mine. The AQM Section has not evaluated this risk. Ammonia can cause serious injury or death. At the mine, an ammonia release could require evacuation of the mine, including residential quarters under severe arctic conditions. No alternative shelter is available at or near the site. Off-site evacuation could be hampered or impossible because of airport closure due to bad weather. The risk is enhanced because medical resources at the site are limited. These risks are not present with the use of Low NOx.

Response: The Department has modeled the ammonia slip from the proposed SCR units at 30 ppm, three times the vendor guaranteed emission concentration. Based on the modeling results the Department found that there should be no effects on human or vegetation health due to the ammonia slip from two SCR units at the Red Dog mine[34]*. The Department investigated the hazard due to accidental ammonia release due to implementation of SCR at the Red Dog mine.*

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[34] ADEC, August 3, 1999, memorandum, Cominco Mine Ammonia Slip, Bill Walker, author, pages 1 & 2.

The Department found no record of injuries or deaths due to implementing SCR in numerous installations throughout the US and the World. In addition the Department found that the use of a urea based SCR system eliminates the use of anhydrous ammonia, and minimizes the amount of aqueous ammonia used thereby minimizing the risk to the public and Cominco employees[35]*.*

Low NOx is a preferable technology based on environmental factors alone because:

- No significant environmental impacts exist from the virtually identical low levels of NO_2 ambient impacts from engines equipped with either SCR and Low NOx,
- No environmental risk to the public exists, and
- SCR presents small, but serious risks to Cominco workers and visitors from ammonia release and exposure.

Response: The Department disagrees that SCR and Low NOx as BACT result in virtual identical low levels of NO_2 impacts. In order for 'virtually identical' impacts to occur, the existing Wartsila engines would also need to be retrofitted with low NOx components. Cominco has voluntarily offered to retrofit all their existing Wartsila engines with Low NOx components.

That no environmental risk to the public exists is immaterial. Projects must always comply with health and welfare standards before a permit is issued[36]*.*

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[35] ADEC, August 10, 1999, memorandum, Cominco NOx BACT, Brian Renninger, author, Appendix A, pages 5-8, Items V.B1 through V.C.

[36] ADEC, August 10, 1999, memorandum, Cominco NOx BACT, Brian Renninger, author, Appendix A, page 5, Item V.A.4.

As mentioned above, the Department reviewed the hazard to workers and visitors due to potential ammonia releases from implementing SCR and we agree with Cominco that the risk is small.

14. BACT Energy impacts--The AQM Section does not take into account the energy impact of SCR. If SCR were installed on MG-5, the waste heat recovery unit could no longer be used to provide heat. Cominco evaluated the possibility and feasibility to move this waste heat unit to another engine. These conclusions were reported to the section which has not questioned the conclusions in the TAR or elsewhere. That evaluation concluded that the relocating the unit is not possible. The result of the loss of heat recovery from MG-5 due to installation of SCR would be installation of a diesel-fired boiler. Cominco would be required to burn up to 531,730 gallons per year of fuel oil to replace the waste heat. Cominco would need to haul the fuel from Red Dog Port by truck, creating additional emissions that would not be released if low NOx were selected.

Because of the substantial energy consumption required due to SCR, low NOx is preferred with respect to energy considerations, even without considering the additional emissions due to burning the additional fuel oil. The later factor provides an additional environmental consideration favoring selection of low NOx over SCR.

Response: The Department concurs that there are energy impacts due to SCR. However, these impacts appear to only for retrofitting MG-5 not the new engine[37]*. The revised NOx BACT in the final TAR addresses the energy impacts due to implementing SCR. Please see section 4.1.3 of the final TAR.*

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[37] ADEC, August 11, 1999, memorandum, Cominco Red Dog – Final Permit Action X065, BACT Analysis for NOx on MG-5 and MG-17, John Stone, author, Attachment 3, page 4 and 5.

15. BACT Economic Considerations--The AQM Section has provided an analysis that compares the cost of SCR and Low NOx. However, that analysis is flawed because the SCR costs of $1,586 per ton NOx removed is for a scenario that is not technically feasible and because the SCR cost does not include the cost of replacing waste heat and other valid costs.

Response: The Department is puzzled by Cominco's assertion. The Department's analysis followed Cominco's assumption for economic costs of an ammonia-based SCR option presented in a January 1999 application supplement.

As noted above, the design of the power house precludes the relocation of the MG-5 waste heat recovery unit. The reasons were provided in Cominco's *Response to January 28, 1999 ADEC Request for More Information*, submitted to ADEC on February 10, 1999. Because the relocation is not possible, the cost of providing the energy from a supplemental heater must be included in the economic analysis. The cost is not included.

Cominco notes that the AQM Section eliminated the cost of production loss and back-up generator rental estimates as unnecessary. This is based upon Cominco's ability to isolate the engine heat recovery units from the glycol loop. However, the complete shut-down of the glycol loop (and the entire power house) would be necessary to install the new supplemental heat generator onto the glycol loop, and is not associated with the existing Wartsila engines. Because a new unit would be installed, the loop must be shutdown until the new isolation equipment associated with the new supplemental heat generator could be installed. The production loss and generator rental estimates are included in the BACT analysis to reflect this cost.

Response: This is no longer an issue since MG-5 is not subject to BACT.

If these costs are included in the analysis, and the other inappropriate adjustments that the Section made to Cominco's analysis are disregarded, the SCR cost per ton of NOx removed is $5,643 using an aqueous ammonia system.

Even without considering the substantial additional costs of heat replacement, the analysis shows that total installed capital cost of SCR is nearly 10 times that for Low NOx, and that the total annualized costs of SCR are more than 12 times the total annualized cost for Low NOx. This understated economic analysis still shows an additional cost per year of over $1,000,000 for SCR than for low NOx. With an expected mine life of at least 40 more years, these costs are very significant, affecting Cominco's cost of production and competitiveness in world markets.

The authority and decisions that define the procedure to weigh economic considerations is outlined on pages 17 and 18 of Appendix A, Comments. EPA's Draft New Source Review Manual (1990) Page 45 states that in order to justify rejection of an alternative such as SCR:

> ...the applicant should demonstrate to the satisfaction of the permitting agency that costs of pollutant removal (e.g., dollars per total ton removed) for the control alternative are disproportionately high when compared to the cost of control for the pollutant in recent determinations."

EPA's Environmental Appeals Board outlined a similar test, specifically the range of costs borne by similar source under recent BACT determinations:

> We accept that cost-effectiveness is determined in most cases by showing that a control option or combination of options is either within or outside the range of costs being borne by similar sources under recent BACT determinations.

In Re Interpower of New York, Inc., PSD Appeals Nos. 92-8, 92-9 (March 6, 1994, Page 23).

According to EPA's Top-Down Guidance, at Page 34:

> ...Absent overriding environmental impact concerns or other considerations, an acceptable demonstration of adverse economic impact can be [an] adequate basis for eliminating [a] control alternative.

Applying these authorities requires ADEC to consider whether the costs that SCR would impose on Cominco at Red Dog are disproportionately high when compared to those being borne by similar sources in recent determinations. For the purposes of providing that information to ADEC, Cominco reviewed and compiled all of the BACT determinations for similar sources. (See figure 8, Appendix A) That compilation demonstrates that SCR, whose costs are disproportionate by an order of magnitude to Low NOx, has not been imposed as BACT on any similar sources in recent determinations. In fact, SCR has been rejected in the most recent such determinations in California. Clearly, SCR should be rejected on economic considerations alone.

Cominco believes the economic considerations clearly favor Low NOx, which has a cost that is a small fraction of the cost of SCR.

Response: The Department has revised the BACT analysis in the final TAR. Please see section 4.1.3 of the final TAR. The Department's revised BACT analysis determined that the economic costs of SCR are excessive for Cominco[38].

16. BACT Final Decision--As Cominco has stressed through-out the permit proceeding, ADEC is required to weigh the three statutory factors in reaching a BACT determination. EPA concurs.

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[38] ADEC, August 11, 1999, memorandum, Cominco Red Dog – Final Permit Action X065, BACT Analysis for NOx on MG-5 and MG-17, John Stone, author, Attachment 3, pages 5 through 8.

Response: The Department conferred with Ray Nye of EPA Region X to discuss the strategy presented in the preliminary permit decision. At that time, EPA had no objections to the approach for the preliminary decision. EPA provided no comments regarding the preliminary decision during the public comment period for the Red Dog Mine Production Rate Increase Project. The Department acknowledges that after the close of the public notice, Ray Nye informed the National Park Service (NPS) and Department Staff that EPA would defend NPS's challenge on the "emission bubble" approach. The approach was set out in the preliminary permit decision by which the Department credited emission reductions from unmodified Wartsila Engines to compare control costs options of SCR versus low NOx configurations.

Ignoring environmental and energy impacts in determining BACT is an ADEC failure to exercise the informed discretion required by statute and regulation. Ignoring these impacts is turning a blind eye to the most important factors that should be weighed in the BACT decision.

Cominco has provided a matrix analysis that weighs all the major relevant factors that might be considered in ADEC's BACT decision. These factors include the technology's control efficiency, NOx emission reduction, ambient air quality compliance, PSD increment consumption compliance, additional energy consumption, additional environmental impact, safety, and the technology demonstration status. This matrix demonstrates that Low NOx and FITR rank first and should be determined to be BACT.

Response: The Department disagrees that environmental and energy impacts were ignored in the preliminary TAR. Pages 39 and 40 of the preliminary TAR address the environmental and energy impacts raised by Cominco in their application.

The revised BACT analysis further addresses the environmental and energy impacts of SCR. Please see section 4.1.3 of the final TAR.

Cominco believes that if energy, environment, and economic considerations are weighed together in accordance with regulations, statutes, and EPA guidance, SCR must be rejected and Low NOx must be selected as BACT for the Wartsila engines at the mine. The ambient NO_2 impact is virtually identical, while SCR presents the additional environmental risk of ammonia release and exposure, as well as causing additional emissions from truck haulage of diesel and ammonia or urea. The necessary addition of a supplemental heat boiler to replace the lost waste heat recovery on MG-5 if SCR is installed would exact an annual energy penalty of more than half a million gallons of diesel fuel. Based on adverse environmental and energy considerations alone, Low NOx should be selected as BACT. These considerations, under EPA guidance cited above, might cause rejection of a technology such as SCR, even if the costs were less than Low NOx costs. Economic considerations, however, when combined with environmental and energy considerations clearly favor rejection of SCR and selection of Low NOx as BACT for the Wartsila engines. Not only is SCR disproportionately costly when compared to Low NOx, but SCR produces no additional air quality benefit while creating additional environmental risks and imposing a significant energy penalty.

Response: The Department has reassessed BACT. See Section 4.1.3 of the final TAR. Upon further consideration of economic impacts, the Department determined the implementing SCR is 'probably excessive'[39].

Cominco believes that ADEC's decision to reject SCR and select Low NOx should be consistent with other BACT

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[39] ADEC, August 11, 1999, memorandum, Cominco Red Dog – Final Permit Action X065, BACT Analysis for NOx on MG-5 and MG-17, John Stone, author, page 2.

decisions nationwide and in Alaska. Because SCR has not been required as BACT on similar sources, ADEC would be arbitrary to do so for the PRI Project.

Response: The Department rejected SCR in the preliminary and final permit decisions. See section 4.1.3 of the final TAR.

* * *

19. Conclusions--The AQM Section's statement in the conclusions regarding Cominco's undertaking is in error and should be corrected. As set forth at length above, Low NOx is clearly BACT for MG-5 and MG-17. Low NOx on the other Wartsila engines is not a substitute, necessary amendment, or part of the BACT for MG-5 or MG-17, but a separate voluntary undertaking by Cominco, which Cominco has asked be made enforceable as BACT.

Response: BACT is a process through which the Best Available Control Technology for a particular emission source is made. We agree that Low NOx on the Wartsila engines other than MG-17 is not BACT. We maintain that retrofitting MG-1 through MG-6 with Low NOx components is necessary to protect the NOx PSD increment. The Department has re-evaluated NOx BACT for the Wartsila engine MG-17 in accordance with the "top-down" approach. The Department concurs that low NOx emission configuration is BACT for the modified Wartsila Engine. See Section 4.1.3 of the final TAR.

* * *

STATE OF ALASKA
DEPT. OF ENVIRONMENTAL CONSERVATION
OFFICE OF THE COMMISSIONER

January 5, 2000

Chuck Clarke
Chuck Findley
EPA, Region X
1200 Sixth Ave.
Seattle, WA 98101

Dear Mr. Clark and Mr. Findley,

I have reviewed your letter and Order dated December 10, 1999, prohibiting Alaska from issuing a Prevention of Significant Deterioration (PSD) permit for a new diesel engine to generate electricity at the Red Dog Mine without first obtaining EPA's written concurrence on Alaska Department of Environmental Conservation's (ADEC) determination of Best Available Control Technology (BACT) for that engine. After review and consideration of the applicable federal law, I believe that the Order is not a valid or proper exercise of EPA's authority. Further, I believe that ADEC's BACT determination is consistent with the Clean Air Act (CAA) and with state law.

The Order has significant adverse impacts on the people of the Northwest Arctic Borough, on Cominco Alaska, and on Cominco's partner, the NANA Native Regional Corporation. Moreover, the Order, and EPA's assertion of the power to coerce ADEC to select EPA's preferred technology as BACT nullifies Alaska's authority and ability to manage a predictable, consistent PSD program for which it has had EPA approval for 15 years. In addition, EPA's Order subjects

ADEC employees to harsh civil and criminal penalties and sanctions for its violation, under § 113 of the CAA.

I would like to describe in more detail Alaska's grave concerns with your Order. First, I do not believe that EPA has the authority to issue such a broad Order. Under EPA's own rules and guidance, and under the EPA-approved State Implementation Plan (SIP) that is governing federal law, ADEC, not EPA, has final PSD permitting authority and the authority to make the final BACT determination for the new engine. That decision is subject to appeal under established state administrative procedures. Those procedures would have been the proper venue for EPA to question ADEC's BACT determination.

EPA issued its Order without participating in the permit issuing process or in the state's administrative process. Had EPA participated in ADEC's permitting process, and commented on the draft permit, it would have been accorded standing under state law to seek an adjudicatory hearing to review the BACT decision for the new engine. That process (unlike EPA's issuance of a § 167 order) would have afforded Cominco Alaska and other interested parties the opportunity to participate in the hearing and would have provided due process. EPA's failure to comment now precludes its resort to that administrative review process. See AS 46.14.200. The courts have stated that EPA's recourse when it disagrees with a state's exercise of discretion under an approved program is not to issue an order countermanding the state's decision, but rather to pursue its rights under the state's administrative process. EPA should not ignore the state process and then attempt to veto the state's decision after the fact.

Second, I believe that Alaska's BACT determination is appropriate, reasonable, and authorized under the CAA. Both federal and state law provide that BACT determinations are to be based upon an analysis of "energy, environmental, and economic impacts and other costs." CAA § 169(3); 18

AAC 50.990(13). EPA has chosen in its own BACT analyses to use a "top down" approach to comparing control technologies. That approach is found solely in EPA's internal guidance, and is not embodied in the CAA nor in implementing regulations. Nevertheless, ADEC has followed EPA's preferred "top down" approach in this case, and has fully explained its reasoning in the Technical Analysis Report that accompanies the permit. Yet EPA still asserts that Alaska's clearly discretionary determination of BACT "violates" the CAA, apparently just because EPA, had it written the permit, would have weighed the factors differently and chosen another control technology. I do not think that the fact that EPA may prefer a different BACT decision makes ADEC's decision a violation of the CAA.

Third, the process by which we got to this point did not demonstrate the usual good faith efforts to resolve differences that our agencies have shared in the past. Although EPA did not even enter this discussion until after the public process had concluded, ADEC held up issuance of the permit for five months to enable discussions to occur with EPA. In fact, we resolved several other issues to our mutual satisfaction, yet, inexplicably, those issues are still addressed in your Order.

Both Chuck Findley and I were trying to find a way to allow Cominco to begin its expanded operations while reserving the only remaining issue in dispute, the BACT determination for the one new diesel engine, MG#17. We had agreed that we did not want to engage in "brinkmanship" by which either EPA or the staff would attempt to achieve some litigation advantage based upon the timing of any order or permit.

I proposed issuing the state permit to allow operation of all engines but MG#17. The permit, as proposed, would specifically prohibit on-site construction of MG#17 until June and also prohibit any irreversible design or equipment procurement that would prevent the installation of SCR technology until May. This would have: allowed us to

continue with dispute resolution, afforded EPA the opportunity to use whatever remedy it chose if we could not reach agreement, allowed Cominco to operate, and avoided writing multiple permits for one facility. EPA rejected this proposal, apparently on the advice of their attorneys that EPA had to issue an order under § 167, although the basis for that advice has never been explained.

I next proposed that if EPA believed it had to issue an order, then we could issue simultaneously both the order and the permit, with an explicit agreement that we would go through dispute resolution and, if that failed, neither side would claim any advantage or suffer any penalty due to who issued which document first. Again, EPA declined, and instead rushed to issue an Order that is unclear, incorrect, and excessively broad. By doing so, EPA has now created an impossible situation for ADEC and its responsible officials, given the potential sanctions we face for violation of the Order.

I have carefully considered the issues EPA raised on the merits of the BACT determination, and the applicable legal authorities. I have carefully considered and weighed protection of the environment and the pros and cons of the different technologies. I have considered the importance of my responsibilities under the state's approved SIP to properly exercise my discretion to issue a PSD permit that, in my judgment, meets all applicable requirements. And, I have considered the importance to Alaska of being able to determine our own environmental and economic policy, as was envisioned by Congress in passing the Clean Air Act and setting forth the role of the states.

Accordingly, I have decided that I cannot and will not retract or render ineffective Cominco's permit, as you have ordered me to do. I am persuaded that, under Alaska's permit as written, significant deterioration will be prevented, and more control will be required of this source than EPA or any other state has required of similar sources in similar circumstances. Further, I have concluded that there is far more at stake here

than a single permit if EPA can simply issue an order negating the discretionary judgement that Alaska exercises under the CAA and pursuant to EPA's approval of Alaska's PSD program, based upon no other reason than that EPA favors another technology, especially when there is no appreciable gain in the surrounding environment. Indeed, if EPA has this authority, there would be no point in a state ever assuming PSD primacy. States would simply become contractors for EPA.

Although ADEC did, in fact, issue the permit with the delayed effective date for the new engine that we had previously proposed in order to proceed with dispute resolution with EPA, it appears that our disagreement over the core issue of which agency has the legal authority to make the final BACT determination for engine MG#17 precludes our ability to continue discussions. The specter of the potential penalties ADEC faces for violation of the Order requires that this core issue be resolved fast. I regret that we have reached this point, but the issuance of EPA's Order has changed the circumstances under which we have been operating. While we normally value and rely upon discussions with EPA, and we were more than willing to do so in this case, it is no longer possible to conduct reasonable discussion under the threat of such draconian sanctions.

For the reasons outlined above, I request that you retract the Order dated Dec. 10, 1999, so that we may continue our discussions on this matter. If you refuse to do so, I will seek review of the Order in the federal courts.

Sincerely,

/s/
Michele Brown

cc: The Honorable Ted Stevens, U.S. Senator
The Honorable Frank Murkowski, U.S. Senator
The Honorable Don Young, U.S. Representative
Carol Browner, Administrator, U.S. EPA
Charlie Curtis, NANA Regional Corporation
Helvi Sandvik, NANA Development Corporation
John Key, Cominco Alaska, General Manager
John Katz, Office of the Governor, Washington D.C.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

FEB 8 2000

Reply To
Attn Of: OAQ-107

CERTIFIED MAIL- RETURN RECEIPT REQUESTED

Norman Mahoney
Registered Agent for
Cominco Alaska, Inc.
717 K Street
Anchorage, Alaska 99501

Re: Administrative Order
Cominco Alaska, Inc. - Red Dog Mine Facility

Dear Mr. Mahoney:

The enclosed Administrative Order is issued pursuant to Sections 113(a)(5) and 167 of the Clean Air Act (CAA or Act), 42 U.S.C. §§ 7413(a)(5) and 7477 and requires Cominco Alaska, Inc. (Cominco) to comply with the terms specified in it.

Section 113(a)(5) of the Act, 42 U.S.C. § 7413(a)(5) provides in part:

> Whenever, on the basis of any available information, the Administrator finds that a State is not acting in compliance with any requirement or prohibition of the [Act] relating to the construction of new sources or the modification of existing sources, the Administrator may –

> (A) issue an order prohibiting the construction or modification of any major stationary source in any area to which such requirement applies;
>
> (B) issue an administrative penalty order in accordance with subsection (d) of this section; or
>
> (C) bring a civil action under subsection (b) of this section.

Section 167 of the Act, 42 U.S.C. § 7477, provides in part:

> The Administrator shall, and a State may, take such measures, including issuance of an order, or seeking injunctive relief, as necessary to prevent the construction or modification of a major emitting facility which does not conform to the requirements of this part, or which is proposed to be constructed in any area designated pursuant to section 7407(d) of this title as attainment or unclassifiable and which is not subject to an implementation plan which meets the requirements of this part.

The Alaska Department of Environmental Conservation (ADEC) Permit No. 9932-AC005 issued to Cominco on or about December 10, 1999, which allowed Cominco to commence construction of the Wartsila diesel generator MG-17 at the Red Dog mine facility fails to comply with Part C of the Act, 42 U.S.C. § 7470-7491, as well as the federal implementing regulations and the Alaska State Implementation Plan. Additionally, the permit was issued in violation of the Order issued to ADEC on December 10, 1999. EPA has issued a Finding of Noncompliance and Violation to ADEC under Section 113(a)(5) of the Act, finding that the State of Alaska failed to comply with Part C of the Act, 42 U.S.C. § 7470-7492, as well as the Federal and State implementing regulations when it issued this permit. Since this permit is invalid as it applies to MG-17, any construction of MG-17 pursuant to ADEC Permit No. 9932-AC005 is not authorized under the Act. The enclosed Administrative Order to

Cominco prohibits the construction of MG-17 prior to demonstrating compliance with Part C of the Act, 42 U.S.C. § 7470-7492, and obtaining a valid permit from ADEC for MG-17.

You have the opportunity to confer with EPA concerning this Order. If you wish to request a conference, to occur no later than March 16, 2000, please call Mr. Hardesty, Chief, Federal and Delegated Air Programs Unit, (206) 553-6641, within 10 days of the date of this letter.

Sincerely,

/s/
Chuck Findley
Deputy Regional Administrator

Enclosure

CC: John Key, General Manager, Cominco
Larry Hartig, counsel for Cominco
Michele Brown, ADEC

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

FEB 8 2000

Reply To
Attn Of: OAQ-107

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Michele Brown
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801-1795

Re: ADEC Permit No. 9932-AC005 for Cominco Alaska, Inc.

Dear Ms. Brown:

This letter is in response to your letter to Chuck Clarke dated January 5, 2000, regarding the Alaska Department of Environmental Conservation's (ADEC's) prevention of significant deterioration (PSD) permit for the Cominco Alaska, Incorporated (Cominco) Red Dog mine facility and the EPA Finding of Noncompliance and Order issued to ADEC on December 10, 1999 (Finding and Order).

As your letter pointed out, EPA's Finding and Order was issued after months of discussion between ADEC and EPA concerning the permit and the proposed nitrogen oxides (NOx) emission limits for the new Wartsila diesel generator, MG-17, at the Red Dog mine. Throughout the discussions, EPA asserted that the State's record did not adequately support the State's determination that the Best Available Control Technology (BACT) for the Wartsila diesel genera-

tor MG-17 was low NOx controls rather than selective catalytic reduction (SCR). We also consistently pointed out that the Clean Air Act expressly provides that EPA retain a federal oversight role in states with an approved PSD program.

Your letter correctly asserts that EPA did not comment on the public record but chose to weigh-in after the State's process was closed. Here's why. The National Park Service has a specific role in review of PSD permits under Clean Air Act regulation. They commented during your process and, not seeing resolution of their issues, requested EPA's involvement.

I understand that you do not agree with our position on these important matters. In spite of the fact we did not reach agreement on either the BACT issue or the issue of EPA's authority, we did resolve a number of other concerns relating to the Cominco permit as it was originally proposed. I appreciate your willingness to explore these issues. I believe the discussions were worthwhile to further our mutual understanding of our respective approaches to protecting air quality in Alaska.

Your letter asserts the EPA's order subjects ADEC employees to harsh civil and criminal penalties. Please be aware that it is not EPA's general practice to name individual State employees when a particular State or State agency is identified as a respondent or defendant in a civil action to enforce the Clean Air Act. We have no intention of imposing sanctions against individual State employees in this matter.

The Finding and Order stated that issuance of a final PSD permit as proposed by ADEC would not be in compliance with the PSD requirements of the Clean Air Act and/or the Alaska SIP. The Finding and Order went on to state that ADEC was prohibited from issuing a PSD permit to Cominco's Red Dog mine facility with limits on the Wartsila diesel generator MG-17 based on low NOx controls (unless ADEC satisfactorily documented why SCR is not BACT).

We are in agreement with the remaining provisions of your permit.

Shortly after receiving the Finding and Order, ADEC issued Air Quality Construction Permit No. 9932-AC005 for the Cominco Red Dog mine. The final permit was accompanied by a Final Technical Analysis Report dated December 10, 1999 (TAR). This permit includes an emission limit based on low NOx controls for the Wartsila diesel generator MG-17.

Based on our review and analysis of the final permit and TAR, we conclude that both fail to comply with Federal and State PSD requirements. Thus, the State is not in compliance with the Clean Air Act. Please regard this as a formal finding under Section 113(a)(5) of the Clean Air Act.

It is still EPA's position that Cominco must obtain a PSD permit with an adequately supported BACT determination requiring the installation of BACT on MG-17 prior to commencing construction of that unit. Accordingly, pursuant to Sections 113(a)(5) and 167 of the Act, 42 U.S.C. §§ 113(a)(5) and 167, EPA is issuing an Administrative Order to Cominco. The Order prohibits Cominco from constructing MG-17 until it receives a valid PSD permit for the unit that complies with the Act. The Order specifically allows Cominco to operate under all other provisions in ADEC Permit No. 9932-AC005. You will be sent a copy of the Order when it is issued to Cominco.

We continue to be willing to discuss this Finding of Non-compliance and Violation with you and your staff. Please feel free to contact me if you wish to discuss this issue further.

Sincerely,

/s/
Chuck Findley
Deputy Regional Administrator

cc: Tom Chapple, ADEC
John Key, General Manager, Cominco

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

MAR 7 2000

Reply To
Attn Of: OCR-158

CERTIFIED MAIL- RETURN RECEIPT REQUESTED

Robert Connery
Holland and Hart
Suite 3200
555 Colorado Street
P.O. Box 8749
Denver, Colorado 80201-8749

Re: Cominco Alaska Inc.'s Request for Stay of EPA's Orders

Dear Mr. Connery:

On February 16, 2000, Cominco Alaska, Inc. (Cominco) requested that EPA stay the Order issued to the Alaska Department of Environmental Conservation (ADEC) on December 10, 1999, and the Order issued to Cominco on February 8, 2000. Cominco contends that the new Wartsila diesel generator, MG-17, is vital to the increased production at the Red Dog mine and that it will suffer lost revenue without it. Cominco also states that due to the short construction season it is feasible to pour concrete foundations for MG-17 only during July and August. Upon consideration of your request and in recognition of the unique weather-related construction limitations present at the Red Dog mine site, EPA is willing to amend the February 8, 2000 Order to Cominco. As amended, the Order does not prohibit the

pouring of concrete for the foundation or on-site activities that need to be undertaken during July and August for weather-related reasons. EPA is declining, however, to stay the December 10, 1999 Order to ADEC.

ADEC Permit No. 9932-AC005 issued to Cominco on or about December 10, 1999, which states that Cominco may commence construction of the Wartsila diesel generator MG-17 at the Red Dog mine facility, fails to comply with Part C of the Clean Air Act (Act), 42 U.S.C. § 7470-7491, as well as the federal implementing regulations and the Alaska State Implementation Plan. Additionally, the permit was issued in violation of the Order issued to ADEC on December 10, 1999. On February 8, 2000, EPA issued a Finding of Noncompliance and Violation to ADEC under Section 113(a)(5) of the Act, finding that the State of Alaska failed to comply with Part C of the Act, 42 U.S.C. § 7470-7492, issued this permit. Cominco received a copy of this notice of noncompliance by fax on February 8, 2000, and certified mail on February 16, 2000. Since this permit is invalid as it applies to MG-17, any construction of MG-17 pursuant to ADEC Permit No. 9932-AC005, with the exception of the activities specified in the enclosed Amended Administrative Order, is prohibited under the Order.

EPA respectfully disagrees with Cominco's position that because EPA has approved Alaska's PSD permitting program as part of the State implementation plan (SIP) EPA lacks the authority to take action in this instance. EPA's approval of a State PSD program does not divest the Agency of the duty to continue appropriate oversight to ensure that permitting decisions made by the State are consistent with the requirements of the Act, EPA regulations and the SIP. To the contrary, several sections of the Act expressly provide the Agency with oversight and enforcement authority over State PSD programs that EPA has approved. See sections 113, 167 and 505(b) of the Act.

Section 113(a)(5) of the Act provides that whenever EPA finds that a State is not acting in compliance with any PSD or other new source requirement of the Act, the Agency may issue an order prohibiting the construction or modification of any stationary source, issue an administrative penalty order or bring a civil enforcement action. This provision also plainly contemplates corrective action by EPA when the Agency believes that a State is not properly implementing new source permitting requirements under its SIP. Sections 113(a)(5) and 167 were the basis for EPA's February 8, 2000 Order to Cominco and are the basis for this Amended Order.

Section 167 of the Act provides that EPA shall issue administrative orders, initiate civil actions or take whatever other action may be necessary to prevent construction of a major stationary source that does not conform to the requirements of the PSD program. Since the Act contemplates that SIPs will include approved PSD programs (see sections 110(a)(2)(C) and 161), it is clear that EPA's authority under section 167 applies to SIP-approved programs, such as Alaska's. Section 167 was the basis for EPA's December 10, 1999 Order to ADEC.

Accordingly, the enclosed Amended Administrative Order is issued pursuant to Sections 113(a)(5) and 167 of the Act, 42 U.S.C. §§ 7413(a)(5) and 7477, and requires Cominco to comply with the terms specified in it. This Amended Administrative Order supersedes and vacates the Administrative Order issued to Cominco on February 8, 2000. The enclosed Amended Administrative Order to Cominco no longer prohibits Cominco from undertaking certain specified activities associated with the construction of MG-17 and selective catalytic reduction (SCR). With the exception of the specified activities, however, the Amended Administrative Order prohibits the construction and installation of MG-17 prior to demonstrating compliance with Part C of the Act, 42 U.S.C. § 7470-7492, and obtaining a valid permit from ADEC for MG-17.

You have the opportunity to confer with EPA concerning this Order. If you wish to request a conference, please call Mr. Douglas Hardesty, Manager, Federal and Delegated Air Programs Unit, within 5 days of issuance of this Order. He may be reached at (206) 553-6641. Such a conference shall occur no later than March 23, 2000. The enclosed Amended Order is effective March 24, 2000.

Sincerely,

/s/
Chuck Findley
Deputy Regional Administrator

Enclosure

CC: John Key, General Manager, Cominco
Larry Hartig, counsel for Cominco
Michele Brown, ADEC

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

MAR 7 2000

Reply To
Attn Of: OAQ-107

CERTIFIED MAIL- RETURN RECEIPT REQUESTED

Norman Mahoney
Registered Agent for
Cominco Alaska, Inc.
717 K Street
Anchorage, Alaska 99501

Re: Administrative Order
Cominco Alaska, Inc. - Red Dog Mine Facility

Dear Mr. Mahoney:

The enclosed Amended Administrative Order is issued pursuant to Sections 113(a)(5) and 167 of the Clean Air Act, 42 U.S.C. §§ 7413(a)(5) and 7477, and requires Cominco to comply with the terms specified in it. This Amended Administrative Order supersedes and vacates the Administrative Order issued to Cominco on February 8, 2000. The enclosed Amended Administrative Order to Cominco no longer prohibits Cominco from undertaking certain specified activities associated with the construction of MG-17 and selective catalytic reduction (SCR). With the exception of the specified activities, however, the Amended Administrative Order prohibits the construction and installation of MG-17 prior to demonstrating compliance with Part C of the Act, 42 U.S.C. § 7470-7492, and obtaining a valid permit from ADEC for MG-17.

Cominco has the opportunity to confer with EPA concerning this Order. If you wish to request a conference, please call Mr. Douglas Hardesty, Manager, Federal and Delegated Air Programs Unit, within 5 days of issuance of this Order. He may be reached at (206) 553-6641. Such a conference shall occur no later than March 23, 2000.

Sincerely,

/s/
Chuck Findley
Deputy Regional Administrator

Enclosure

CC: John Key, General Manager, Cominco
Larry Hartig, counsel for Cominco
Robert Connery, counsel for Cominco
Michele Brown, ADEC

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 14 1983

MEMORANDUM

SUBJECT: Guidance On Enforcement of Prevention of Significant Deterioration Requirements Under the Clean Air Act

FROM: Michael S. Alushin
Associate Enforcement Counsel for Air

Edward E. Reich, Director
Stationary Source Compliance Division

TO: Regional Counsels
Regions I-X

Directors, Air Management Divisions
Regions I, V and IX

Directors, Air and Waste Management Divisions
Regions II-IV, VI-VIII, and X

This guidance discusses enforcement of Part C of Title I of the Clean Air Act, dealing with the prevention of significant deterioration (PSD) of the ambient air quality. The guidance explains the use of Section 167 of the Clean Air Act as an enforcement tool and provides assistance in choosing between §167 and the alternatives available for enforcing against PSD violations. Violations of Part C include construction or operation of a PSD source (as defined under the Act and the PSD regulations) without a permit, construction or operation with an invalid permit, and construction or

operation in a manner not consistent with a validly issued permit.

We believe that §167 of the Act provides EPA with a significant enforcement mechanism in addition to §113, the Agency's main enforcement tool, but it does not preclude resort to any remedies available under §§113 or 120. Section 167 should be used in situations where a source is constructing or operating without a valid permit or in violation of a valid permit and EPA's main interest is a quick imposition of injunctive relief to stop the violation. Where time is not of the essence and/or the Agency wishes to collect penalties in addition to exacting injunctive relief, §§113 or 120 provide more appropriate remedies. Thus, depending upon the circumstances of a particular case, EPA may commence one or more of the following actions against a source that is in violation of PSD requirements:

(a) Issue an order or seek injunctive relief under §167 to prevent the source from constructing or operating in violation of the PSD requirements;

(b) Issue an order to comply under §113(a);

(c) Seek civil remedies under §113(b);

(d) Seek criminal penalties under §113(c);

(e) Assess and collect noncompliance penalties under §120.

I. Analysis of Section 167

Section 167 of the Clean Air Act provides:

> The Administrator shall, and a State may, take such measures, including issuance of an order, or seeking injunctive relief, as necessary to prevent the construction of a major emitting facility which does not conform to the requirements of this part, or which is proposed to be constructed in any area included in the list promulgated pursuant to paragraph (1)(D) or (E) of subsection (d) of Section

107 of this Act and which is not subject to an implementation plan which meets the requirements of this part.

42 U.S.C. §7477 (1978)

Depending upon whether or not EPA has approved a State's Part C (PSD) State Implementation Plan (SIP) provisions under Section 110(a)(2) of the Clean Air Act or delegated the PSD program to the State, Section 167 creates two separate and distinct enforcement obligations for EPA. This is consistent with EPA's policy of allowing the States primacy where they have the main responsibility for a program. In those States that have not been delegated the PSD program or do not have approved SIP PSD provisions as required by §161 (PSD requirements for SIPs), EPA has the authority to regulate the construction of all major emitting sources that are subject to PSD review under the Act. Any person wishing to construct such a source in one of those States will be required by §165 (preconstruction requirements) to obtain a PSD permit from EPA. If the proposed source would violate the provisions of the PSD regulations, EPA must deny the permit. If EPA issues a permit, the Agency will be responsible for initiating appropriate proceedings should the source subsequently violate any permit provisions. Likewise, the Agency is responsible for taking enforcement action against a source which commences construction without first obtaining a PSD permit.

Once its PSD SIP provisions have been approved or delegated, pursuant to §110(a)(2) and 40 CFR 51.24, the State, rather than EPA, assumes primary responsibility for administering the PSD program. The Agency does not completely relinquish its obligations, however. Rather, it assumes an oversight function. PSD permits issued by the State remain federally enforceable. 40 CFR §§52.02(d), 52.21(r), and 52.23. If the State takes appropriate enforcement action, it is unnecessary for EPA to initiate enforcement proceedings. If the State fails to take appropriate action, however, Section 167 provides that EPA must take measures adequate to

prevent the construction of the noncomplying source. EPA can take such action at any time the Agency deems it necessary. The Agency is not forestalled by any action initiated by the State from simultaneously or subsequently taking action against a source that already had commenced construction or operation. Thus, EPA retains PSD enforcement authority and, where appropriate, is expected to initiate PSD enforcement proceedings both before and after the PSD SIP revisions have been approved.[1/]

Additionally, §167 requires EPA to take action directly against a source found being constructed or operating pursuant to a PSD permit that conflicts with the requirements of the Clean Air Act, implementing regulations, or approved SIP requirements. This provision gives the Administrator authority similar to that possessed under §113(a)(5) and (b)(5) to prevent illegal construction or operation of new sources in nonattainment areas.

* * *

B. Construction With an Invalid Permit

EPA will also be able to utilize the provisions of §167 to prevent a source from constructing with a State-issued permit

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1/ Senator Muskie noted this continuing Federal enforcement obligation. He stated: "[o]nce the State adopts a permit process in compliance with this provision, the Environmental Protection Agency role is to seek injunctive or other judicial relief to assure compliance with the law." 123 Cong. Rec. S 9169 (daily ed. June 8, 1977) (remarks of Senator Muskie). Senator Muskie's reference to "injunctive or other judicial relief" should not be construed as precluding resort to an administrative order mechanism. Such an interpretation would conflict with the clear wording of §167. Rather, we believe that Senator Muskie's reference to "other judicial relief" provides clear support for the proposition that EPA may resort to the civil and criminal penalties provisions of §113(b) and (c).

that EPA feels is invalid. There are basically two types of situations involving construction with an invalid permit. In the most common situation, the source can be expected to obtain a valid permit quickly. In other circumstances, however, it cannot be expected that a valid permit can issue soon. Before deciding on a course of action to be taken with a source constructing pursuant to an invalid permit, an EPA Regional Office needs to make a probability assessment as to the likelihood that a source will be able to obtain a valid permit quickly. For the purposes of allowing construction pursuant to an invalid permit, the period of thirty (30) days (the period analogous to that allowed under a Section 113(a) order) should be considered to be "quickly."

In the situation where EPA believes a valid permit will issue quickly, the procedures to be followed should be similar to those used under §113(a)(5) to prevent the construction of new sources in nonattainment areas. Sources should be issued an order, specifying precisely the nature of the defect in the permit, and given 30 days in which to obtain a valid permit while they proceed with construction. Issuance of an immediate cease construction order, while available, usually would be an unnecessary sanction. A source that has obtained a PSD permit, even though invalid, has presumably undergone some preconstruction review. Moreover, since it is the State, rather than the source itself, that is primarily at fault, immediate sanctions might be inappropriate.

In some situations, however, such as those where EPA believes that a source cannot be operated without violating an increment or where construction will foreclose EPA's options in terms of what BACT requirements will apply to a source, an immediate cease construction order under §167 should be issued and construction should not be allowed to commence or continue until a valid permit is issued.

In cases against sources constructing pursuant to an invalid permit, the error is presumed to have been the State's.

Therefore, even though construction may be halted, no penalty is appropriate unless the source is somehow at fault or the source does not cooperate after the discovery of the violation. For no-penalty actions, §167 is an effective enforcement tool.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 15 1988

MEMORANDUM

SUBJECT: Procedures for EPA to Address Deficient New Source Permits Under the Clean Air Act

FROM: Michael S. Alushin
Associate Enforcement Counsel for Air
Office of Enforcement and Compliance Monitoring

John S. Seitz, Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Addressees

I. Introduction

This guidance applies to permits issued for major new sources and major modifications under both the prevention of significant deterioration (PSD) program and the nonattainment new source review (NSR) program. It contains three sets of procedures -- one for permits issued pursuant to EPA-approved state programs (NSR permits and PSD permits in more than half the states) one for permits issued by states pursuant to delegations of authority from EPA, and one for instances where EPA issues the permit directly. An appendix of model forms appears at the end.

The need for this guidance has become increasingly evident in the last two years. Before then, EPA had attempted only once, in 1981, to enforce against sources constructing or operating with new source permits the Agency determined to

be deficient. In 1986, EPA litigated Greater Detroit Recovery Facility v. Adamkus et al. No. 86-CU-72910-DT (October 21, 1986). In that case, EPA wanted to enforce against a major stationary source constructing with a PSD permit issued by Michigan under a delegation agreement with EPA. The Agency had first determined that the best available control technology (BACT) determination for SO_2 in the permit was inadequate. Before EPA started formal enforcement action, the source filed suit against the Agency, arguing that EPA had no authority to "second guess" the BACT determination and that, in any event, we should be equitably foreclosed from challenging the permit because we had remained silent during the two years since we had failed to comment on the permit. The court agreed and granted the source's motion for summary judgment.

The Detroit case was an example of the need for prompt and thorough EPA review of and written comments on new source permits. Our ability to influence the terms of a permit, both informally and through legal procedures, diminishes markedly the longer EPA waits after a permit is issued before objecting to a specific term. This is due both to legal constraints, that is, tight time limits for comments provided in the regulations, and to equitable considerations that make courts less likely to require new sources to accept more stringent permit conditions the farther planning and construction have progressed. Accordingly, as a prerequisite to successful enforcement action, it is imperative that EPA review all major source permit packages on a timely basis and provide detailed comments on deficiencies. If EPA does not obtain adequate consideration of those comments, it is also important for EPA to protect air quality by prompt and consistent enforcement action against sources whose permits are found lacking.

Because PSD permits are issued on a case-by-case basis, taking into consideration individual source factors, permitting decisions involve the exercise of judgment. However, although not an exhaustive list, any one of the following

factors will normally be sufficient for EPA to find a permit "deficient" and consider enforcement action:

1. BACT determination not using the "top-down" approach.
2. BACT determination not based on a reasoned analysis.
3. No consideration of unregulated toxic pollutants in BACT determination.
4. Public notice problems – no public notice & comment period or deficiencies in the public notice.
5. Inadequate air quality modeling demonstrations.
6. Inadequate air quality analysis or impact analysis.
7. Unenforceable permit conditions.
8. For sources that impact Class I areas, inadequate notification of Federal Land Manager or inadequate consideration of impacts on air quality related values of Class I areas.

In NSR permitting, each of the following factors, while not necessarily an exhaustive list, are grounds for a deficient permit:

1. Incorrect LAER determination, i.e., failure to be at least as stringent as the most stringent level achieved in practice or required under any SIP or federally enforceable permit.
2. No finding of state-wide compliance.
3. No emissions offsets or incorrect offsets.
4. Public notice problems – no public notice and comment or deficiencies in public notice.
5. Unenforceable permit conditions.

DECLARATION OF DOUGLAS E. HARDESTY

I, Douglas E. Hardesty, declare as follows:

Introduction

1. I am the manager of the Federal and Delegated Programs Unit, Office of Air Quality, Region 10, United States Environmental Protection Agency (EPA or the Agency). I have served in this capacity since late 1997. My unit is responsible for the federal implementation and the Agency's oversight of states' Clean Air Act (CAA) permitting programs in Region 10. EPA's Region 10 encompasses the States of Alaska, Idaho, Oregon and Washington.

2. I was, and am, very familiar with the EPA actions at issue in this case. I was personally and regularly involved in communications with the State of Alaska and EPA management. With respect to the State's best available control technology decision for the generator at issue in this case, senior EPA regional management accepted my recommendations.

3. On June 21, 2000, I certified that to the best of my knowledge and belief, the documents identified in the Cominco Alaska, Inc., Index to the Administrative Record constitute the complete administrative record of the following EPA actions challenged by Petitioners State of Alaska, Department of Environmental Conservation (ADEC) and Cominco Alaska, Inc. (Cominco) in this case:

(a) the December 10, 1999 Finding of Noncompliance and Order issued to ADEC under sections 113(a)(5) and 167 of the CAA (the Order part of which EPA withdrew on April 25, 2000);

(b) the February 8, 2000 Administrative Order issued to Cominco under sections 113(a)(5) and 167 of the CAA; and

(c) the March 7, 2000 Amended Administrative Order issued to Cominco under sections 113(a)(5) and 167 of the CAA.

For ease of reference, I will refer to these actions as the "findings and orders." The index to the certified Administrative Record is attached to this declaration (Attach. A). The findings and orders are not attachments to this declaration, but they are in the Administrative Record at, respectively, bate stamps COM 1, COM 3, and COM 7 (they also can be found in Petitioners' Combined Excerpts of Record (PER) 234-37; 254-70; and 340-59). (Counsel informs me that a complete copy of the Administrative Record was filed with the Court on January 11, 2001.)

4. On March 27, 2001, the Court issued an Order which gave EPA the option to proceed by "submit[ting] a complete administrative record which will allow this Court to review the justifications for the EPA's decisions to issue the Orders before us." Since the Court's Order of March 27, 2001, I have reviewed again the documents contained in the Administrative Record. I hereby reaffirm the completeness of that record. To the best of my knowledge and belief, the Administrative Record filed with the Court contains all the documents that I and other EPA decision-makers considered and relied upon when issuing the findings and orders. In this declaration, I will point out the key documents that led up to EPA's decision that ADEC's December 10, 1999 Permit No. 9932-AC005 did not subject Cominco's proposed MG-17 power generator to the best available control technology (BACT) to limit emissions of nitrogen oxides (NOx), a regulated air pollutant, as required by CAA section 165(a)(4), 42 U.S.C. § 7475(a)(4), and Alaska's State Implementation Plan (SIP). I will point to excerpts in the Administrative Record where EPA explained its basis for concluding that ADEC's record and analysis did not support its selection of low NOx controls (Low NOx), as opposed to selective

catalytic reduction (SCR), as the BACT for the MG-17 generator.

5. In brief, and as explained in more detail below:

(a) Between December 10, 1999 and March 7, 2000, EPA issued a series of findings and orders related to a permit action involving the State of Alaska and Cominco. EPA took these actions because ADEC acted arbitrarily and capriciously in determining the BACT for the MG-17 generator.

(b) If their programs are approved by EPA, states have a statutory obligation to determine what constitutes BACT, an emission limitation based on the maximum degree of emission reductions that is achievable for a major source of air pollution, after taking into account the energy, environmental, and economic impacts and other costs of achieving that reduction. These state permitting authorities have discretion in determining how they will weigh these various statutory considerations in a BACT analysis. However, EPA may intervene in such permit actions if the State fails to exhibit a lawful and rational exercise of discretion.

(c) For the Cominco permit action at issue, ADEC stated that it was using the widely accepted "top-down" approach to determining BACT (explained below) as its methodology for weighing the various considerations. Under this methodology, the most stringent control candidate -- in this case, selective catalytic reduction -- is presumed to be the best available control technology. A less effective alternative – like low NOx burners – may be chosen only if the permit applicant demonstrates that energy, environmental, and/or economic impacts and other costs would make application of the "top" control unreasonable or inappropriate for that facility.

(d) In this case, EPA repeatedly expressed concern to ADEC that its analysis and record as provided to EPA failed to justify its decision that Low NOx was BACT for the

Cominco's proposed MG-17 power generator. EPA encouraged the State and Cominco to provide information that would support rejecting the most stringent control candidate, SCR. ADEC's own record shows SCR to be technically and economically feasible, and to have no adverse environmental or energy impacts if applied to the Cominco facility.

(e) EPA ultimately concluded that without a reasoned basis for rejecting SCR based on energy, environmental and economic impacts and other costs, ADEC's decision that Low NOx is BACT was arbitrary and capricious. Consequently, EPA issued the findings and orders at issue in this case. This declaration highlights areas of the State's record and analysis EPA reviewed in reaching a decision to issue the findings and orders.

The State's Responsibilities in Issuing Prevention of Significant Deterioration Permits

6. When a state, such as Alaska, has a prevention of significant deterioration (PSD) program as part of its state implementation plan (SIP) that has been approved by EPA, the state becomes responsible for issuing permits that comply with the PSD requirements of the CAA and applicable regulations and policies. These include the state's own SIP, regulations, and guidance. Here, ADEC administers Alaska's PSD program, and in issuing PSD permits must insure that, among other things, a major new or modified source of air pollution (like Cominco's proposed MG-17 generator) installs BACT.

7. One of the CAA's PSD requirements is that major new or modified sources be "subject to the best available control technology" for each regulated air pollutant. 42 U.S.C. § 7475(a)(4). Alaska's PSD program states that ADEC "will issue a permit only if the applicant shows that . . . the best available control technology for controlling

emissions of each pollutant will be installed." 18 AAC 50.400(c)(3)(A) (1983) (Attach. B).

8. The CAA defines BACT as "an emissions limitation based on the maximum degree of reduction of each [regulated pollutant] . . ., which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility." 42 U.S.C. § 7479(3). Similarly, Alaska's PSD program defines BACT as "that emission limitation which represents the maximum reduction achievable for each regulated air pollutant, taking into account energy, environmental and economic impacts, and other costs." 18 AAC 50.900(9) (1991) (Copies of these federal and state provisions can be found in Brief for Respondents, Tabs A and B.)

9. In part "to assist permitting authorities and PSD applicants in conducting BACT analysis," EPA issued a draft New Source Review Workshop Manual (Manual) in 1990. COM 71-001 (Attach. C) (The entire portion of the Manual pertaining to BACT, Chapter B, can be found in Respondents' Supplemental Excerpts of Record (RER), Tab 2.) To best implement the statute, EPA follows, and the Manual recommends, a "top-down" approach to analyzing and determining BACT:

> In brief, the top-down process provides that all available control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent – or "top" – alternative. That alternative is established as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not "achievable" in that case. If the most stringent technology is eliminated

in this fashion, then the next most stringent alternative is considered, and so on.

COM 71-086.

10. The "top-down" approach not only is the Agency's recommended guidance but also is, as ADEC correctly stated, the "most commonly used procedure for determining BACT." COM 33-029 (which also can be found at PER 029). In this case, at all times, ADEC stated that it was applying the "top-down" approach to determine BACT for Cominco's MG-17 generator. COM 17-040 (Preliminary Report of May 1999); COM 29-042 (Revised Report of September 1999); and COM 33-044 (Final Report of December 1999).

EPA's Role in States with Approved PSD Programs

11. In Region 10, the States of Alaska, Idaho and Oregon have EPA-approved PSD programs. That means that in these states, the state issues PSD permits for the construction or modification of major stationary sources. EPA's role is one of overseeing state permitting actions to assure that the permits comply with the CAA and SIP requirements and, if appropriate, taking enforcement action. As explained in an EPA guidance memorandum from 1983,

> Once its PSD SIP provisions have been approved . . ., the State, rather than EPA, assumes primary responsibility for administering the PSD program. The Agency does not completely relinquish its obligations, however. Rather, it assumes an oversight function. . . . EPA retains PSD enforcement authority and, where appropriate, is expected to initiate PSD enforcement proceedings . . . .

COM 69-003 (Attach. D) (This memorandum can be found, in its entirely [sic], at RER, Tab 1.)

12. EPA has long understood its oversight and enforcement authority in states with approved PSD programs, like Alaska, to encompass the requirement to ensure that new or modified sources of air pollution be subject to BACT controls. For example, a EPA guidance memorandum from 1988 states that

> Because PSD permits are issued on a case-by-case basis, taking into consideration individual source factors, permitting decisions involve the exercise of judgment. However, although not an exhaustive list, any one of the following factors will normally be sufficient for EPA to find a permit "deficient" and consider enforcement action:
>
> 1. BACT determination not using the "top-down" approach.
>
> 2. BACT determination not based on a reasoned analysis.
>
> . . . .

COM 70-002 (Attach. E). A 1993 EPA guidance memorandum similarly advises the Agency's Regions to

> follow[] two general principles in reconciling the tensions between the state and federal responsibilities in the administration of [new source review (NSR)] programs [such as the PSD program]. First, it is the state that must make the final decision on all issues relating to the specific permit. There is no suggestion in the Act's NSR provisions that EPA has authority to second-guess the state on matters that are a lawful and rational exercise of discretion properly conferred upon the state. Second, and conversely, EPA is the agency with primary authority to interpret the federal law. In so doing, EPA acts to ensure that the state exercises its discretion within the bounds of the law and otherwise acts in accordance with applicable

> statutory and regulatory norms. In carrying out these principles, it is apparent that EPA acts largely as a guarantor that the state follow applicable procedures and not act arbitrarily or violate any objective standards that may apply, while the state remains free to exercise informed judgment in making the determinations. * * * For example, . . . in the case of a decision applying . . . BACT under section 165(a)(4) for PSD, if a state has met all procedural norms, considered all available control technologies, and given a reasoned justification for the basis of its decision, EPA has no grounds on which to challenge a final substantive state decision that does not violate such objective standards.

COM 72-002, 003 (Attach. F).

13. As specified in CAA section 165(d), 42 U.S.C. § 7475(d), states must send EPA a copy of each PSD permit application and notify EPA of every action relating to it. Under my supervision, Region 10 employees review PSD permits proposed by states to determine whether a proposed permit is consistent with the requirements of the CAA and the standards for issuing permits established by the State, and provide comments to the state permitting authorities as necessary.

14. In this case, as explained below, EPA reviewed the Cominco permit for, among other things, compliance with the BACT requirement. EPA reviewed the adequacy of ADEC's record to support its BACT determination pursuant to ADEC's chosen "top-down" approach (which, as noted, is consistent with EPA guidance).

ADEC's May 1999 Preliminary Proposed Permit

15. On May 4, 1999, ADEC issued and submitted for public comment a proposed PSD permit for the Cominco Red Dog Mine facility. The proposed permit is in the Administrative Record at COM 18.

16. The proposed permit was accompanied by ADEC's Preliminary Technical Analysis Report (Preliminary Report) which describes, among other things, the state's assessment of the best available control technology for the MG-17 generator. The Preliminary Report is in the Record at COM 17, and excerpts are attached to this declaration (Attach. G) (more excerpts can be found at RER, Tab 5).

17. As the Preliminary Report states, the proposed permit would allow Cominco to implement a production rate increase project at the Red Dog zinc mine in Alaska. The project is intended to increase the mill's processing rate to 3,500,000 tons of ore per year and raise concentrate production to 1,400,000 tons per year. COM 17-006. The project and the operation of the new or modified equipment as proposed by Cominco will result in an increase of NOx emissions of over 1,100 tons per year, among the increased emissions of many other regulated air pollutants. COM 42-003 (Document COM 42 is part of Cominco's amended application, and can also be found at RER, Tab 4.) Two power generators, the existing MG-5 and the proposed new MG-17, were among the emission sources that were subject to BACT review at the time of the Preliminary Report. COM 17-039.

18. The BACT analysis for MG-17 and MG-5 that ADEC first submitted for public comment is in the Administrative Record at COM 17-030 through 17-045. The Preliminary Report first states that "[o]f the available control technologies, [selective catalytic reduction (SCR)] is the most stringent control, providing 90% reduction of NOx." COM 17-042. Also, ADEC found that "SCR is technically and economically feasible." COM 17-030. ADEC specifically evaluated the costs associated with a number of scenarios using SCR and found "all of the costs shown on [Table 4.1.3] to be economically feasible." COM 17-042. These costs ranged from $ 1,586 to $5,643 per ton of NOx removed. COM 17-042. ADEC stated that SCR's costs "are well

within what ADEC and EPA considers economically feasible" COM 17-042. ADEC, though, chose as BACT a less stringent emission control technology, Low NOx, instead of SCR "due to other considerations." COM 17-030. These "other considerations" were Cominco's proposal to retrofit Low NOx modifications to Cominco's existing Wartsila generators MG-1, MG-2, MG-3, MG-4 and MG-6. Relying on the emission reductions resulting from the low NOx modifications to MG-1, MG-2, MG-3, MG-4 and MG-6, ADEC found low NOx controls to constitute BACT on generators MG-5 and MG-17. COM 17-045.

19. Essentially, ADEC's Preliminary Report concluded that BACT for the MG-5 and MG-17 generators was SCR, but rather than directly impose the SCR-based emission limitation on these units, ADEC attempted to "bubble" or "emissions trade" these units with other existing units at that plant to achieve an SCR-equivalent level of emission reductions across the plant.

20. The Red Dog Mine is located in Northwest Alaska about 5 miles west of the Noatak National Preserve and 32 miles northeast of Cape Krusenstern National Monument. The National Park Service, the federal land manager for these areas, submitted comments on the proposed permit. Its comments included the concern that the proposed permit did not require emission limits based on BACT for the MG-17 (as well as MG-5). These comments are in the Administrative Record as document COM 46 (which also can be found at RER, Tab 7).

21. Following the National Park Service's comments, EPA identified a number of concerns with the proposed permit and Preliminary Report, including the BACT determination for the Wartsila generators. I directed my staff to conduct staff level discussions with ADEC staff regarding our concerns. On July 29, 1999 Anita Frankel, Director of Region 10's Office of Air Quality (my supervisor at the

time), sent a letter to Tom Chapple, ADEC, reiterating EPA's major concerns with the proposed permit:

> Although ADEC states in its analysis that selective catalytic reduction (SCR), the most stringent level of control, is economically and technologically feasible, ADEC did not propose to require SCR. Instead, ADEC concluded that installation of [Low NOx] on all seven generators and fuel injection retard [] on some of the generators constituted BACT. EPA disagrees with this conclusion and believes that SCR is BACT for [MG-5] and [MG-17]. As we discussed, once it is determined that an emission unit is subject to BACT, the PSD program does not allow the imposition of a limit that is less stringent than BACT even if equivalent emission reductions are obtained by imposing new controls on other emission units.

COM 47-001 (Attach. H) (which can also be found at RER, Tab 9). I note that EPA reviewed ADEC's preliminary determinations as part of the Agency's review of the adequacy of ADEC's subsequent record on the permit. ADEC bares [sic] a burden of not only providing a reasoned justification for its final BACT determination, but it must also show how it has responded to public comment and explain any basis for changing its determination when it issues the final permit.

22. Ms. Frankel's comment about BACT being unit-specific (that is, not subject to the kind of "emissions trading" that ADEC's Preliminary Report engaged in) is supported by Alaska's SIP. It states that ADEC "will issue a permit only if the applicant shows that . . . [BACT] . . . will be installed and used for <u>each</u> new or modified source." 18 AAC 50.400(c)(3)(A) (1983) (emphasis added) (Attach. B). (A similar provision of the Alaska SIP is quoted in an EPA letter to ADEC, COM 50-002 (Attach. L).) EPA's Manual similarly states that the "BACT requirement applies to <u>each</u> individual new or modified affected emission unit and

pollutant activity at which a net emissions increase would occur." COM 71-088 (emphasis added).

ADEC's September 1999 Revised Proposed Permit

23. In early September 1999, ADEC issued a revised proposed PSD permit for the Cominco Red Dog Mine facility. The revised proposed permit is in the Administrative Record at COM 30.

24. The revised proposed permit was accompanied by ADEC's revised Technical Analysis Report (Revised Report). The Revised Report is in the Record at COM 29, and excerpts are attached to this declaration (Attach. I) (excerpts can also be found at RER, Tab 12).

25. With respect to the BACT determination for the MG-17 and MG-5 generators, the Revised Report acknowledged that the Preliminary Report's reliance on "other considerations" (that is, emissions trading) for a BACT decision was improper:

> In this case, the emissions reductions achieved by the applicant's proposal to retrofit the existing, unmodified engines into a 1999 configuration is not a consideration of the BACT review provided for by the applicable law and guidelines. Therefore, it cannot be used to temper the stringency of BACT.

COM 29-047.

26. The Revised Report also reaffirmed ADEC's reliance on the top-down methodology for selecting BACT, providing a detailed accounting of the process. COM 29-044. ADEC further explained the objective criteria that are to be applied (and by which EPA should judge the adequacy of ADEC's record and analysis) when an applicant attempts to demonstrate that more effective controls are not achievable:

> When Congress created the BACT definition, they allowed the stringency of the BACT to be tempered by considerations of one or more collateral impacts – energy, environmental, or economic. This was intended to account for situations where the use of BACT in one area of the country was not applicable to another area of the country, due to differences in feedstock material, plant configuration, or other reasons.
>
> EPA and the courts have interpreted the collateral impacts clause to serve as a safety valve, allowing a less stringent BACT whenever compelling and atypical energy, environmental, or economic circumstances specific to a facility constrain it from using [] the most effective technology.

COM 29-045.

27. Despite the facts that (1) selective catalytic reduction is the most effective control technology available, COM 29-033, 29-042; (2) has favorable environmental impacts, COM 29-048, 29-049; and (3) contributes no adverse energy impacts, COM 29-050; ADEC continued to select Low NOx as BACT. COM 29-055. ADEC stated that, with respect to SCR's economic impacts, Cominco claimed that the "costs are very significant, affecting Cominco's cost of production and competitiveness in the world markets." COM 29-051. Yet, according to ADEC, Cominco did not present "detailed financial information showing [SCR's cost's] effect on the operation." COM 29-053. As such, ADEC could not and did not make any "judgment" about the site-specific impact of SCR's costs "on the operation, profitability, and competitiveness of the Red Dog Mine." COM 29-053. Instead, ADEC estimated a unit cost for SCR on both generators (3 cents per kilowatt-hour) and concluded that this

> would be equivalent to a 20% increase in the electric rate of the facility. In [ADEC's] judgment, this is a dispro-

> portionate cost increase when [Cominco is] viewed as an electric utility. Furthermore, the cost [of SCR, estimated at $2,100 per ton of NOx removed] is significantly higher on a cost-per-ton removal basis in comparison to the $0 to $936/ton of recent BACT decision[s] for similar installations.

COM 29-053.

28. Before and after ADEC's revised proposed permit, I recall several conversations with ADEC permit staff and supervisors in which they stated that they personally believed that SCR was economically feasible. An August 1999 intra-ADEC memorandum confirms this. COM 21 (Attach. J) (excerpts also can be found at RER, Tab 10). In this memorandum, ADEC staff stated that "[i]t is clear that SCR (the most effective individual technology) should be considered technologically, environmentally, and economically feasible for the Red Dog power plant engines." COM 21-022.

29. After issuance of the Revised Report, EPA and ADEC engaged in additional conversations. In a letter to ADEC on September 15, 1999, Ms. Frankel stated that

> EPA remains concerned that the PSD analysis conducted by Cominco and accepted by ADEC is inadequate for several reasons. . . . EPA disagrees with ADEC's determination that the Best Available Control Technology [] for Wartsila generators MG-5 and MG-17 is low NOx burners rather than selective catalytic reduction [].

COM 48-001 (Attach. K) (also on file with the Court as RER, Tab 13). Ms. Frankel "urge[d] ADEC to delay issuance of the PSD permit to Cominco and to conduct a thorough PSD analysis of all the modifications to the facility, including the diesel generators[.]" COM 48-003.

30. A letter dated September 20, 1999, from the National Park Service expressed continued concern over the proposed permit and ADEC's approach to BACT for the MG-17 and MG-5 generators. The letter also contained a description of other applications of SCR and a list of close to 200 applications of SCR to oil and gas fired engines around the world, contradicting ADEC's statement that "the cost is significantly higher on a cost-per-ton removal basis in comparison to the $ 0 to 936/ton of recent BACT decision[s] for similar installations." COM 49-002, 49-003 (Attach. L) (which also can be found at RER, Tab 14). (After receiving a copy of the Service's letter, EPA apparently removed from document COM 49 the list of the nearly 200 applications of SCR, but the list is in the Administrative Record at COM 50-014 through 50-020.). The National Park Service also provided information to support the comment that

> although ADEC formerly accepted SCR as economically feasible at a cost as high as $5,643 per ton of NOx removed, it has now concluded that a cost as low as $2,100 is excessive. . . . Our experience in reviewing permit applications across the U.S. is that states are typically setting a cost effectiveness range of $2,000 - 5,000 per ton of NOx, with $ 4,000 per ton the most frequently used threshold.

COM 49-004.

31. Additionally, Charles E. Findley, Region 10's then-Deputy (now Acting) Regional Administrator, talked with Michele Brown, ADEC Commissioner, to further explain EPA's concerns and to better understand the State's rationale for its permitting decisions. Following that conversation, on September 29, 1999, Ms. Frankel sent a letter to ADEC summarizing EPA's concerns and describing our review of the State's Preliminary and Revised Reports. COM 50 (Attach. M) (which also can be found at RER, Tab 15). EPA explained its agreement with ADEC that SCR is

technically feasible, and that ADEC appropriately evaluated environmental and energy considerations. COM 50-003, 50-004. EPA found insufficient, however, ADEC's economic impact analysis: "elimination of SCR as BACT based upon cost-effectiveness grounds is not supported by the record and is clearly erroneous." COM 50-004. As EPA explained,

> Cost-effectiveness [dollars per ton of pollutant reduced] is one of the economic impact analysis which may be considered when determining if a technology represents BACT for a specific application. However, a poor cost effectiveness in and of itself should not be construed as a measure of adverse economic impacts. . . . [T]he Region contends that an accurate cost-effectiveness for the SCR option is well within the range of reasonable costs for controlling NOx from the Wartsila engines. Early in the process, the Region informed ADEC that a reasonable cost-effectiveness of controlling NOx emissions from similar sources would be no greater than $10,000 per ton of NOx removed . . . .
>
> [T]he cost-effectiveness [in this case] is well within the range that the EPA considers reasonable and nothing in the [Revised Report] demonstrates to EPA that the cost-effectiveness is unreasonable.

COM 50-004. The letter also attached the same table that the National Park Service had provided, listing worldwide applications of SCR. COM 50-014 through 50-020. Again, countering ADEC's reliance on prior BACT decisions as a rational basis for rejecting SCR, EPA stated that

> Cost-effectiveness was not calculated in previous BACT determinations in which SCR was required on engines under the top-down BACT analysis because the companies did not argue that the technology should be rejected due to economic considerations. . . .

COM 50-004. The fact that so many installations of SCR exist was important to my recommendation (which was accepted by the Region) that SCR is economically feasible for this type of application, absent unusual site-specific circumstances.

32. Also, in the September 1999 letter, EPA explained that

> Cominco has not adequately demonstrated site-specific factors to support [its] claim that the installation of [selective catalytic reduction] is economically infeasible at the Red Dog Mine. . . .
>
> [I]n order to justify economic infeasibility, the Region believes that the economic impact analysis conducted in the draft permit should have gone beyond a review of cost effectiveness to include an analysis of whether requiring Cominco to install and operate the more effective control strategies would have any adverse economic impact upon Cominco specifically.

COM 50-004, 50-005. In conclusion, EPA summarized its view that

> the permit limits for the Warsila engines for NOx emissions contained in the PSD [revised proposed] permit are clearly erroneous and the BACT analysis for . . . . MG-5 and MG-17 clearly indicates that selective catalytic reduction is the control technology of choice. . . . The BACT analyses are deficient in that they fail to reach conclusions that are supported by the PSD regulations, procedures or available information.

COM 50-009. EPA, therefore, again "urge[d] ADEC to delay issuance of the PSD permit to Cominco until the permit complies with the Clean Air Act." COM 50-001.

33. On October 21, 1999, I and other representatives from EPA, including Region 10's Deputy Administrator, traveled to Anchorage, Alaska to meet with ADEC and Cominco. Following the meeting, the parties engaged in several phone conversations and exchanged correspondence. With regard to BACT on Cominco's MG-17 generator, these communications involved both EPA's authority to take issue with ADEC's decision and our conclusion that ADEC's selection of Low NOx was clearly erroneous. COM 51, COM 53, COM 56.

34. With respect to ADEC and Cominco's challenge to EPA's statutory authority, EPA explained to them in a letter dated November 10, 1999, that

> EPA has a statutorily mandated role in the PSD permitting process in Alaska and in the rest of the nation . . . .
>
> Section 167 of the [CAA], 42 U.S.C. § 7477, provides EPA with the authority to act in precisely this kind of situation. Specifically, Section 167 provides that the Administrator shall take such measures, including issuance of an order, as necessary to prevent the construction or modification of a major emitting facility which does not conform to the requirements of Part C of the [CAA]. Additionally, it is the Agency's policy that when a regional office determines that a permitting authority is likely to grant an improper permit, the appropriate response is to issue a section 167 order demanding that the permit not be issued. In this instance, because the proposed permit would allow Cominco to construct a major source without requiring BACT it is entirely appropriate for EPA to exercise its statutory authority. . . . [T]here is no relevant case law supporting the proposition that EPA's involvement prior to the issuance of the PSD permit is inappropriate.

COM 55-001 (Attach. N) (which also can be found at RER, Tab 17).

35. EPA also specifically addressed the issue of whether SCR is economically feasible:

> ADEC's own analysis supports the determination that BACT is SCR, which renders ADEC's decision in the proposed permit erroneous.
>
> As we discussed at the meeting, EPA does not believe that the cost effectiveness stated in the [Revised Report] indicates that the installation of SCR is economically infeasible. These costs are well within the range of costs EPA has seen permitting authorities nationwide accept as economically feasible for NOx controls except where there are compelling site specific factors that indicate otherwise. Furthermore, in the [Preliminary Report] ADEC indicated the costs for SCR were "well within" what ADEC considers economically feasible (preliminary [report] at p. 41). The ADEC's record does not support its change in its decision as stated in the [Revised Report] that SCR is not economically feasible.

COM 55-002.

36. Additionally, EPA addressed ADEC's concern about the precedential effect of requiring SCR in Cominco's permit on rural Alaskan utilities:

> ADEC has expressed its concern that if SCR is required at Cominco, then SCR would automatically be required for new or modified engines at rural electric utilities. The concern is understandable given the essential nature of the service provided by the rural utilities in Alaska. We share your concern regarding the cost of electricity in rural Alaska and the impact of those costs on the rate payers. In accordance with EPA guidance and case law, BACT determinations are made based on individual con-

> sideration of the specific facts and circumstances at the facility being permitted. . . . The significant and unique local factors associated with rural electric utilities serving small Alaskan communities would be specifically analyzed in any BACT determination involving the rural utility. We are currently reviewing such an analysis for Nome Joint Utility System (NJUS) and have provided you with a letter regarding that proposed permit . . . . As noted in the letter on NJUS, [its] status as a non-profit, isolated public utility, influences how those "other costs" [CAA section 169(3)] are considered in determining BACT.

COM 55-002.

37. I note that EPA's initial concerns about BACT on MG-5, one of Cominco's existing generators, were resolved shortly after the October 1999 meeting among the parties. In short, Cominco decided to retrofit its existing generators MG-1, 3, 4 and 5 with Low NOx -- allowing it to obtain a sufficient increase in power generation and yet keep these existing generators' net increase in NOx emissions from being subject to BACT review. COM 55-002, 55-003; From this point on, EPA focused our concerns on ADEC's BACT determination for the MG-17 generator.

EPA's Finding and Order to ADEC, and ADEC's Final Permit

38. By December 1999, as explained above, EPA had extensively reviewed ADEC's record and analysis to see if its BACT determination was consistent with the Clean Air Act and the federally approved Alaskan state implementation plan.

39. In spite of a number of discussions between Region 10's Deputy Regional Administrator and the ADEC Commissioner, the agencies reached an impasse. EPA asserted throughout the discussions, and to date, that the State had not

adequately justified the selection of low NOx controls as the required BACT technology. Because the permit contained an emission limit for the MG-17 generator based on Low NOx, without adequate justification to demonstrate that Low NOx constituted BACT in this case, the permit was not in compliance with Part C of the Clean Air Act (the PSD requirements) or with the Alaska SIP.

40. Section 167 of the Clean Air Act, 42 U.S.C. § 7477, provides that the Administrator shall take such measures, including issuance of an order, as necessary to prevent the construction or modification of a major permitting facility which does not conform to the requirements of Part C of the Act. Section 113(a)(5) of the CAA, 42 U.S.C. § 7413(a)(5), provides that if on the basis of any available information, the Administrator finds that a State is not acting in compliance with any requirement, it may, among other things, issue an order prohibiting the construction or modification of the source at issue. Thus, the Act provides authority for EPA involvement when necessary to prevent the construction or modification of a facility that does not satisfy the requirements of the Act. It is Agency policy that when a regional office determines that a permitting agency is likely to grant an improper permit, the appropriate response is to issue a Section 167 Order prohibiting the issuance of the permit, or, if the permit has already been issued, to prohibit the construction of the major source until a valid permit is issued. In this instance, because the permit would allow Cominco to construct a major source without requiring BACT controls, EPA decided that it was entirely appropriate for EPA to exercise its statutory authority to prevent the construction of the MG-17 generator.

41. On December 10, 1999, EPA issued a Finding of Noncompliance and Order to ADEC barring issuance of the permit with BACT limits for the MG-17 generator based on Low NOx (unless ADEC could demonstrate that Low NOx was BACT). The cover letter to the finding and order

explained "EPA's assessment that the permit as currently drafted [the September 1999 revised proposed permit and report] does not comply with the PSD provisions of the [CAA] or the Alaska [SIP]." COM 1-001 (Attach. O). First, EPA explained its statutory authority:

> [W]hile ADEC retains the permitting authority over the PSD program in the State of Alaska, EPA retains federal oversight as part of its responsibility to ensure national consistency. Thus, EPA will continue to review nationally significant issues and will review a State permitting decision on a case-by-case basis when appropriate. Sections 113 and 167 of the Act provide EPA with the authority and responsibility to act in precisely this type of situation. Accordingly, the enclosed Finding and Order is issued under the authority of sections 113 and 167 of the [CAA], 42 U.S.C. §§ 7413 and 7477.

In the Finding and Order, after quoting sections 113(a)(5) and 167 of the Act, EPA further explained that

> A State does not conform to the requirements of Part C of the Act [the PSD provisions] if, among other things, it allows a major emitting facility to commence construction or modification prior to receipt of a PSD permit or issues a PSD permit to a facility without subjecting the facility to BACT for each pollutant . . . .

COM 1-009 (¶ 22).

42. EPA then pointed out its factual basis for its conclusion that "ADEC's decision in the proposed permit . . . is both arbitrary and capricious":

> ADEC's own analysis supports the determination that BACT is selective catalytic reduction (SCR) . . . . The State's analysis as reflected in both the preliminary and [September 1999 Revised] technical analysis reports indicates that SCR is technically feasible. Furthermore,

> contrary to ADEC's final conclusions, the State's record reflects that the cost-effectiveness and the collateral issues of energy, environmental, or economic impacts, and other costs, do not justify failure to select SCR as BACT in this case. EPA does not believe that the cost-effectiveness analysis in the [Revised Report] demonstrates that the installation of SCR is economically infeasible. These costs are well within the range of costs EPA has seen permitting authorities nationwide accept as economically feasible for NOx control, except where there are compelling site-specific factors that indicate otherwise. Additionally, in the preliminary [Report], p. 41, ADEC indicated the costs for SCR were "well within" what ADEC considers economically feasible. ADEC's record simply does not support its decision that BACT for . . . MG-17 is low NOx controls rather than SCR.

COM 1-002. Similarly, the Finding and Order contains a discussion of the facts. For example, see COM 1-011 (¶ 32); 1-012 (¶¶ 38.b & 39.b).

43. EPA also provided ADEC another opportunity to justify its decision. Specifically, the letter stated:

> In an effort to revolve [sic] the issue regarding BACT for MG-17, we are willing to continue discussions with ADEC and Cominco. . . . We are available to review and consider any additional information or analyses provided by ADEC or Cominco to support a determination that SCR is not BACT for modified or new Wartsila generators at the Red Dog mine facility.

COM 1-002.

44. Later that same day, shortly after receiving the EPA Order, ADEC issued Air Quality Construction Permit No. 9932-AC005 to Cominco that called for emission limits on

the MG-17 generator based on Low NOx rather than SCR. COM 33 (which also can be found at PER 120-233).

45. The Final Report accompanying the December 10, 1999 permit describes the State's rationale for its BACT determination for MG-17. COM 33-028 to COM 33-053 (Attach. P) (which also can be found at PER 028-053). Claiming it followed the "top down" approach, ADEC reiterated that selective catalytic reduction was the most effective technically feasible method to control the NOx emissions from the MG-17 generator. With SCR, MG-17 would emit only 53 tons of NOx per year; with Low NOx, it would emit over 10 times more NOx every year. COM 33-044, 33-045. The Final Report then summarized ADEC's consideration of the collateral factors. The Final Report explained that there is not a compelling case to reject SCR due to adverse environmental concerns, there are no energy considerations that justify rejecting SCR as BACT, and that the cost effectiveness analysis determined it would cost $2,100 per ton of NOx removed. COM 33-048.

46. The Final Report also states that ADEC agrees that its original approach in the Preliminary Report -- to "temper[] the stringency of BACT by crediting [Cominco] with emissions reductions from sources that were not part of the permit action" -- was not proper under "applicable law or guidelines." COM 33-045.

47. ADEC explained, however, that its "foremost consideration" for rejecting SCR in favor of Low NOx on MG-17 was that

> The Red Dog Mine plays a unique and continuing impact on the economic diversity of this region. Therefore, the Department has chosen to consider the direct costs of SCR technology and its relationship to retaining the Mine's world competitiveness as it relates to community socioeconomic impacts for the foremost consideration to judge economic impacts of SCR. To support Cominco's Red Dog Mine Production Rate Increase Project, and its contributions to the region, [ADEC] has rejected [SCR] based on excessive economic cost–$2.9 million capital cost, with annualized costs approaching $635,000.

COM 33-051. (I note that "$ 2.9 million" appears to be a scrivener's error in light of other references to "$ 2.1 million" like at COM 33-050.)

48. At the same time, the Final Report fails to explain how application of SCR will affect the Red Dog Mine's world competitiveness as it relates to community socioeconomic impacts. In fact, the Final Report states that Cominco has not presented detailed financial information showing the effect of the control cost on the company operation, and therefore "no judgement can be made as to the impact of a $2.1 million control cost on the operation, profitability and competitiveness of the Red Dog Mine." COM 33-050. (Cominco had declined to present the same information to EPA after we requested it at the October 1999 meeting. COM 53-001.) Additionally, and significantly, ADEC did not explain why it now found SCR to be have [sic] an excessive economic cost despite its early record-based conclusion in the Preliminary Report that SCR is economically feasible.

49. Upon my staff's and my personal review and careful consideration of the Final Report and documents provided to EPA by ADEC and Cominco, EPA found that ADEC's decision to reject the most effective technically available control technology remained arbitrary and capricious. Therefore, on February 8, 2000, EPA issued a Notice of Noncompliance to the State of Alaska informing the State and Cominco that the December 10, 1999 Permit No. 9932-AC005 was not in compliance with the Clean Air Act. COM 5 (Attach. Q) (which also can be found at RER, Tab 19). Specifically, EPA stated:

> Based on our review and analysis of the final permit and [technical analysis report], we conclude that both fail to comply with Federal and State PSD requirements. Thus, the State is not in compliance with the Clean Air Act. Please regard this as a formal finding under Section 113(a)(5) of the Clean Air Act.
>
> It is still EPA's position that Cominco must obtain a PSD permit with an adequately supported BACT determination requiring the installation of BACT on MG-17 prior to commencing construction of that unit. Accordingly, pursuant to Sections 113(a)(5) and 167 of the Act, 42 U.S.C. §§ 113(a)(5) and 167, EPA is issuing an Administrative Order to Cominco.

COM 5-002.

50. On April 25, 2000, EPA withdrew the December 10, 1999 Order it had issued to ADEC because, after ADEC issued the permit prohibited by the Order, the Order did not impose any continuing prohibitions or obligations applicable to ADEC. COM 10.

EPA's Order (and Amended Order) to Cominco

51. EPA guidance discusses the approach to take in a situation like the one here (where a state issues an invalid permit or EPA wants to stop construction with a valid permit). Although sections 113(a)(5) and 167 authorize EPA to bring a civil action, in addition to authorizing it to proceed administratively, standard Agency procedure is that "EPA should issue [an order] if it has determined that there is a reasonable chance the source will comply. Otherwise, the Region should move directly to [judicial action]." COM 70-006. That is,

> EPA should normally first issue an administrative order. The Agency should then file a civil action if a violating source does not immediately comply with the order. In

> cases where EPA has good reason to believe that the order would not be obeyed, however, we should file a civil action for injunctive relief immediately, without first issuing an order.

COM 69-004. EPA followed this standard Agency procedure here.

52. On February 8, 2000, after EPA found ADEC's permit to be out of compliance with the CAA and Alaska's SIP, EPA issued Cominco an Administrative Order to prevent the company from constructing the MG-17 generator prior to obtaining a valid PSD permit from ADEC, that is, one with a legally supportable BACT determination. COM 3. In the cover letter, EPA quoted the applicable statutory authorities (sections 113(a)(5) and 167) and explained:

> [ADEC] Permit No. 9932-AC005 issued to Cominco on or about December 10, 1999, which allowed Cominco to commence construction of the Wartsila diesel generator MG-17 at the Red Dog mine facility fails to comply with Part C of the Act, 42 U.S.C. § 7470-7491, as well as the federal implementing regulations and the Alaska [SIP]. Additionally, the permit was issued in violation of the Order issued to ADEC on December 10, 1999. EPA has issued a Finding of Noncompliance and Violation to ADEC under Section 113(a)(5) of the Act, finding that the State of Alaska failed to comply with Part C of the Act, 42 U.S.C. § 7470-7492, as well as the Federal and State implementing regulations when is [sic] issued this permit. Since the permit is invalid as it applies to MG-17, any construction of MG-17 pursuant to ADEC Permit No. 9932-AC005 is not authorized under the Act.

COM 3-002 (Attach. R).

53. By letter dated February 16, 2000, Cominco requested that EPA stay the findings and orders. COM 64, 65.

54. On March 7, 2000, EPA issued an Amended Order to Cominco which vacated and superceded the February 8, 2000 Administrative Order. As amended, the March 7, 2000 Administrative Order did not prohibit Cominco from conducting specified weather-limited construction activities. The Amended Order indicated that Cominco was specifically allowed to continue construction or operation of portions of the Red Dog Mine facility other than the MG-17 generator as authorized by the ADEC December 10, 1999 permit. COM 7 and COM 8. In a cover letter accompanying the amended order, EPA responded to Cominco's contention that EPA was without statutory authority to issue the findings and orders:

> EPA's approval of a State PSD program does not divest the Agency of the duty to continue appropriate oversight to ensure that permitting decisions made by the State are consistent with the requirements of the Act, EPA regulations and the SIP. To the contrary, several sections of the Act expressly provide the Agency with oversight and enforcement authority over State PSD programs that EPA has approved. See sections 113, 167 and 505(b) of the Act.

COM 7-002.

Conclusion

55. For the reasons in the Administrative Record as highlighted above, EPA concluded that ADEC arbitrarily and capriciously selected Low NOx, as opposed to selective catalytic reduction, as the best available control technology to limit emissions of NOx from Cominco's proposed new power generator, MG-17, at the Red Dog Mine in Alaska. EPA issued the findings and orders because ADEC's BACT decision was not in compliance with the Clean Air Act and Alaska's state implementation plan, and because those actions were necessary to prevent Cominco from constructing the power generator without the requisite controls.

56. My review of ADEC's record and analysis leads me to conclude that the State's BACT decision in this case was based on an improper, non-statutory political factor. In ADEC's own words, the main reason it selected Low NOx as BACT was "to support" Cominco's operations – even though Cominco did not (and undoubtedly could not) provide any information that its "operation, profitability and competitiveness" would be any different, much less harmed, if it had to install SCR on the MG-17 generator. This case emphasizes the importance of EPA's role in ensuring national consistency and that states exercise their discretion responsibly.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 23 day of May, 2001.

/s/

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